FISCAL YEAR 1996 WELL PLUGGING AND ABANDONMENT PROGRAM
Y-12 PLANT, OAK RIDGE, TENNESSEE

APRIL 1997

Prepared by
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for the
Water Compliance Department
Environmental Compliance Organization
Oak Ridge Y-12 Plant
Oak Ridge, Tennessee

Managed by
Lockheed Martin Energy Systems, Inc.
for the
U.S. Department of Energy
Under Contract Number DE-AC05-84OR21400

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SEPTEMBER 1996
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<thead>
<tr>
<th>ACRONYMS</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB</td>
<td>Ash Disposal Basin</td>
</tr>
<tr>
<td>API</td>
<td>American Petroleum Institute</td>
</tr>
<tr>
<td>BCGS</td>
<td>Below current ground surface</td>
</tr>
<tr>
<td>BGS</td>
<td>below ground surface</td>
</tr>
<tr>
<td>BMP</td>
<td>best management practices</td>
</tr>
<tr>
<td>BTOC</td>
<td>Below top of casing</td>
</tr>
<tr>
<td>Energy Systems</td>
<td>Lockheed Martin Energy Systems, Inc. (formerly Martin Marietta</td>
</tr>
<tr>
<td></td>
<td>Energy Systems, Inc.)</td>
</tr>
<tr>
<td>FID</td>
<td>flame ionization detector</td>
</tr>
<tr>
<td>FY</td>
<td>fiscal year</td>
</tr>
<tr>
<td>GBRFA</td>
<td>Gum Branch Road Functional Area</td>
</tr>
<tr>
<td>GWPP</td>
<td>Groundwater Protection Program</td>
</tr>
<tr>
<td>Highland</td>
<td>Highland Drilling Company</td>
</tr>
<tr>
<td>HSEA</td>
<td>Health, Safety, Environment, and Accountability Organization</td>
</tr>
<tr>
<td>ID</td>
<td>inside diameter</td>
</tr>
<tr>
<td>IR</td>
<td>Ingersoll-Rand</td>
</tr>
<tr>
<td>LEFPC</td>
<td>Lower East Fork Poplar Creek</td>
</tr>
<tr>
<td>OD</td>
<td>outside diameter</td>
</tr>
<tr>
<td>ORR</td>
<td>Oak Ridge Reservation</td>
</tr>
<tr>
<td>OVA</td>
<td>organic vapor analyzer</td>
</tr>
<tr>
<td>P&amp;A</td>
<td>plugging and abandonment</td>
</tr>
<tr>
<td>PID</td>
<td>photoionization detector</td>
</tr>
<tr>
<td>PVC</td>
<td>polyvinyl chloride</td>
</tr>
<tr>
<td>QA/QC</td>
<td>quality assurance/quality control</td>
</tr>
<tr>
<td>SAIC</td>
<td>Science Applications International Corporation</td>
</tr>
<tr>
<td>TD</td>
<td>total depth</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

This report is a synopsis of the progress of the well plugging and abandonment program at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee, from August 1995 through August 1996. A total of 27 wells, piezometers, and borings were plugged and abandoned during the period of time covered in this report. All wells and borings were plugged and abandoned in accordance with the Monitoring Well Plugging and Abandonment Plan for the U.S. Department of Energy, Y-12 Plant, Oak Ridge, Tennessee (HSW, Inc. 1991).
1. INTRODUCTION

In September 1995, Science Applications International Corporation (SAIC) was authorized by Lockheed Martin Energy Systems, Inc. (Energy Systems) to provide technical oversight for the plugging and abandonment (P&A) of obsolete, damaged, and obstructing groundwater monitoring wells, piezometers, and coreholes in the vicinity of the Oak Ridge Y-12 Plant at Oak Ridge, Tennessee from October 1, 1995 through September 30, 1996. The scope of the authorized oversight was to supervise drilling activities and to provide health and safety monitoring during those activities. Energy Systems provided procedures and guidelines for P&A, waste disposal, and health and safety monitoring requirements.

The criteria for determining the need for the P&A of monitoring wells, piezometers, and coreholes were stated in the Monitoring Well Plugging and Abandonment Plan for the Department of Energy Y-12 Plant, Oak Ridge, Tennessee (HSW, Inc. 1991). The P&A of a well, piezometer, or boring occurred if: (1) its construction did not meet current standards (substandard construction); (2) it was irreparably damaged or had deteriorated beyond practical repair; (3) its location interfered with or otherwise impeded site operations, construction, or closure activities; or (4) special circumstances existed as defined on a case-by-case basis and approved by the Y-12 Plant Groundwater Protection Program (GWPP) Manager.

This report presents a summary of the activities performed during the fiscal year (FY) 1996 Plugging and Abandonment Program, and includes all wells decommissioned between August 1995 and July 1996. Note: the wells decommissioned from August 1995 to September 30, 1995 (part of the Federal FY 1995) are included in this summary report because the FY 1995 summary report deadline required that preparations begin before the end of the fiscal year. A total of 27 monitoring wells, piezometers, and borings were decommissioned in the period covered by this report (well location maps are found in Appendix F). In addition to this introduction, this summary report contains:

- general geologic setting of the Y-12 Plant and vicinity;
- discussion of well P&A methods, grouting procedures, and waste management practices (a Waste Management Plan for Drilling Activities is included in Appendix C);
- summaries of plugging and abandonment activities at each site; and
- quality assurance/quality control (QA/QC) and health and safety protocols used during the FY 1996 Plugging and Abandonment Program.

Copies of the well activity/progress reports, P&A diagrams, well cuttings field screening/disposal sheets, and equipment decontamination summaries are included in Appendices A, B, D, and E, respectively.

All decommissioned wells were maintained by the Y-12 Plant GWPP within its administrative area, which includes Bear Creek Valley from Y-12 Plant proper to the Clinch River, the southern flank of Pine Ridge, Chestnut Ridge, and parts of Bethel Valley.
2. GENERAL GEOLOGY

2.1 LOCATION AND PHYSIOGRAPHY

The Oak Ridge Y-12 Plant is located in Bear Creek Valley on the U.S. Department of Energy Oak Ridge Reservation (ORR), in the southwestern corner of Anderson County. The area of interest covered by this report includes Pine Ridge (which bounds Bear Creek Valley to the north), Chestnut Ridge (to the south of Bear Creek Valley), and parts of Bethel Valley.

The ORR, occupying an area of approximately 55 square miles, lies in a portion of the Tennessee section of the Valley and Ridge Physiographic Province (McMaster 1963). This province is characterized by narrow, elongated ridges and valleys trending northeast-southwest. Resistant sandstone, siltstone, and siliceous limestone and dolostone typically form the ridges; the valleys are commonly underlain by less resistant shale and soluble carbonates (Rodgers 1953). Elevations within the ORR range from about 900 ft to just over 1200 ft above mean sea level.

2.2 STRATIGRAPHY

Four major stratigraphic units, classified according to lithology, fossils, and age, underlie the Bear Creek Valley and vicinity. From oldest to youngest, these units are the Rome Formation, Conasauga Group, Knox Group, and Chickamauga Group. The formations located in and around Bear Creek Valley generally strike N47°E to N67°E. Regional dips range from 30° to 50° to the southeast (King and Haase 1987). Figures 2.1 and 2.2 represent a generalized geologic cross section and map, respectively, that illustrate the locations and stratigraphic relationships of the major stratigraphic groups and formations that occur in the Bear Creek Valley area.

The Rome Formation, which forms Pine Ridge, is of Lower Cambrian age and consists of interbedded sandstone, shale, and siltstone with local beds of dolostone (McMaster 1963).

The Conasauga Group, of Middle to Upper Cambrian age, has been subdivided into six formations of alternating, predominantly shale and limestone lithologies. The six formations, from oldest to youngest, are the Pumpkin Valley Shale, Rutledge Limestone, Rogersville Shale, Maryville Limestone, Nolichucky Shale, and Maynardville Limestone. Detailed lithologic descriptions of these formations are given in King and Haase (1987). Figure 2.3 presents the relative positions of the member formations of the Conasauga Group, in cross section, as they appear in Bear Creek Valley.

Chestnut Ridge, to the south of Bear Creek Valley, is underlain by siliceous dolostones of the Knox Group. This upper Cambrian to lower Ordovician-aged unit is divided into five formations that are, from oldest to youngest, the Copper Ridge Dolomite, Chepultepec Dolomite, Longview Dolomite, Kingsport Formation, and Mascot Dolomite. Detailed lithologic descriptions of the Knox Group formations are published in Milici (1973).

All of the bedrock formations in Bear Creek Valley and vicinity are overlain by unconsolidated deposits of fill, alluvium, colluvium, and in situ weathered bedrock (residuum and saprolite). The thickness of unconsolidated deposits overlying the Conasauga and Chickamauga Groups (occupying valleys) ranged from approximately 1.0 ft to as much as 46.0 ft. Unconsolidated deposits overlying the Knox Group on Chestnut Ridge are considerably thicker than those in the adjacent valleys.

Figure 2.4 is a generalized stratigraphic column of the major stratigraphic units and accepted subdivisions of the Y-12 Plant area bedrock formations.
Fig. 2.1. Generalized geologic cross-section through the Y-12 Plant and vicinity.

Source: McMaster 1963
Fig. 2.2. Bear Creek Valley geologic map.
Fig. 2.3. Generalized geologic cross-section of the member formations of the Conasauga Group.
<table>
<thead>
<tr>
<th>Age</th>
<th>Group</th>
<th>Formation</th>
<th>Approximate Thickness (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chickamauga</td>
<td>Undifferentiated</td>
<td>Not Determined</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1750</td>
</tr>
<tr>
<td></td>
<td>Knox</td>
<td>Mascot Dolomite</td>
<td>400-800</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kingsport Formation</td>
<td>200-320</td>
</tr>
<tr>
<td>Lower Ordovician</td>
<td></td>
<td>Longview Dolomite</td>
<td>250-450</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not Determined</td>
<td>725-880</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chepultepec Dolomite</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Copper Ridge Dolomite</td>
<td>900-1000</td>
</tr>
<tr>
<td>Middle &amp; Upper Cambrian</td>
<td>Conasauga</td>
<td>Maynardville Limestone</td>
<td>416-450</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nolichucky Shale</td>
<td>422-550</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maryville Limestone</td>
<td>346-445</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rogersville Shale</td>
<td>90-120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rutledge Limestone</td>
<td>90-120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pumpkin Valley Shale</td>
<td>260-320</td>
</tr>
<tr>
<td>Lower Cambrian</td>
<td>Rome</td>
<td>Not Determined</td>
<td>800+</td>
</tr>
</tbody>
</table>

Fig. 2.4. Stratigraphic units in the vicinity of the Y-12 Plant.
3. WELL PLUGGING AND ABANDONMENT

3.1 DRILLING CONTRACTOR

The principal drilling contractor for plugging and abandonment activities at the Y-12 Plant during FY 1996 was Highland Drilling Company (Highland). All plugging and abandonment activities were performed by Highland (Table 3.1).

Highland Drilling Company utilized either an air rotary drilling rig, a utility augering truck, or a backhoe outfitted with an auger motor to plug and abandon wells during FY 1996. An Ingersoll-Rand (IR) XL-750 air rotary drilling rig was used in the decommissioning of wells: 1004, GW-002, GW-448, GW-452, GW-670, LL/HAZ-06, LL/HAZ-11, LL/HAZ-12, LL/HAZ-14, P&A 1, P&A 2, and P&A 3. An IR T4W air rotary rig was used on wells: B-1, B-3, 1095, 1096, GW-007, GW-295, and GW-297. An Altec Auger Truck was used in the decommissioning of wells GW-660 and GW-669. A Ford 455 backhoe equipped with an auger motor was used on wells GW-671 and GW-721. Wells 56-4C, GW-320, GW-321, and GW-672 were plugged/grouted in place; no drilling equipment was utilized in the decommissioning of these wells.

3.2 PLUGGING AND ABANDONMENT METHODS

Four generalized plugging and abandonment methods, approved by the Tennessee Department of Environment and Conservation, were followed. The four methods are discussed in Monitoring Well Plugging and Abandonment Plan for the Department of Energy Y-12 Plant, Oak Ridge, Tennessee (HSW, Inc. 1991). These methods are applicable to different types of well, piezometer, or boring construction. Wells that were plugged and abandoned during FY 1996 required the use only of methods A or C.

Method A is used for wells constructed of 7.0-in. outside diameter (OD) steel or stainless steel well casing, typically completed with 5.0- to 20.0-ft well screens and sand filter packs. Wells completed in bedrock may also have 8.0- to 12.0-in. OD steel or polyvinyl chloride (PVC) surface casing extending from ground surface to the top of bedrock. Some wells may also be completed with a conductor casing in place. Method A involves the over wash and removal of casing with washover pipe. Once the well casing has been removed, the borehole is reamed with a tricone bit at least 0.25 in. larger in diameter than the original bore. American Petroleum Institute (API) Class A (Type I) neat cement is tremied to within 4.0 ft of the surface (if there is no surface casing or conductor casing) and, after verification of the depth to the grout plug, the remaining 4.0 ft of bore is capped using compacted noncontaminated soil or local materials. If the well was completed with surface casing, the first grout plug is tremied to the bottom of the surface casing and allowed to cure. The surface casing is then over washed in the same manner as the inner casing, and grout is tremied from the bottom to within 4.0 ft of the surface. If the well was also completed with a conductor casing, it is removed in a manner similar to that for the surface casing. During FY 1996, method A was followed for the plugging and abandonment of wells GW-002, GW-007, GW-295, GW-297, GW-320, GW-321, GW-660, GW-669, GW-670, GW-671, and GW-672.

Method C is used for wells constructed of 7.0-in. OD or smaller PVC well casing, typically completed with 5.0- to 20.0-ft well screens and sand filter packs. Wells completed in bedrock may also have 8.0- to 12.0-in. OD steel or PVC surface casing extending to bedrock in addition to conductor casing. In method C, the well casing is removed by either over washing or (if the well casing material allows) by milling the well casing with a tricone roller bit. In both cases, the bore is reamed to at least 0.25 in. larger than the original diameter. The initial grout plug is created by placing API Class A neat cement by tremie to within 4.0 ft of the surface or to the bottom of surface casing. If surface casing or conductor casing is used in the well construction, removal is
<table>
<thead>
<tr>
<th>Well Number</th>
<th>Contractor</th>
<th>Service supplied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1004</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>1095</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>1096</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>56-4C</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>B-1</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC piezometer</td>
</tr>
<tr>
<td>B-3</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC piezometer</td>
</tr>
<tr>
<td>GW-002</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a stainless-steel screened well</td>
</tr>
<tr>
<td>GW-007</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a stainless-steel screened well</td>
</tr>
<tr>
<td>GW-295</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a stainless-steel screened well with a surface casing</td>
</tr>
<tr>
<td>GW-297</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a stainless-steel screened well with surface casing</td>
</tr>
<tr>
<td>GW-320</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a stainless-steel screened well</td>
</tr>
<tr>
<td>GW-321</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a stainless-steel screened well</td>
</tr>
<tr>
<td>GW-448</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>GW-452</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>GW-660</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a stainless-steel screened well</td>
</tr>
<tr>
<td>GW-669</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a stainless-steel screened well</td>
</tr>
<tr>
<td>GW-670</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a stainless-steel screened well</td>
</tr>
<tr>
<td>GW-671</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a stainless-steel screened well</td>
</tr>
<tr>
<td>GW-672</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a stainless-steel screened well</td>
</tr>
<tr>
<td>GW-721</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC recovery well</td>
</tr>
<tr>
<td>LL/HAZ-06</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>LL/HAZ-11</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>LL/HAZ-12</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>LL/HAZ-14</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>P&amp;A 1</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>P&amp;A 2</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
<tr>
<td>P&amp;A 3</td>
<td>Highland Drilling Company</td>
<td>Plugging and abandonment of a PVC screened well</td>
</tr>
</tbody>
</table>

Table 3.1. Summary of drilling contractor services provided at each abandoned well, piezometer, or boring.
done as described in method A. The bore is capped using compacted, noncontaminated soil to the surface. During FY 1996, method C was used in the plugging and abandonment of wells 1004, 1095, 1096, 56-4C, B-1, B-3, GW-448, GW-452, GW-721, LL/HAZ-06, LL/HAZ-11, LL/HAZ-12, LL/HAZ-14, P&A 1, P&A 2, and P&A 3.

3.3 GROUTING PROCEDURES

Screened Monitoring Wells and Piezometers

Following removal of screen and casing from these wells, and subsequent conditioning of the borehole, neat cement grout was placed into the bore to within ≤ 4.0 ft of the bottom of surface casing (if no surface casing was present, grout was brought to within ≤ 4.0 ft of the ground surface). After the grout had cured, surface casings (if any) were removed, and neat cement grout was placed into the reamed bore to within 4.0 ft below ground surface (BGS). This grout was allowed to cure, and the remaining open bore was filled with a clay/soil plug.

Highland either hand-mixed API Class I (Type I) grout used in P&A or used premixed cement of the same specifications delivered to the site by a cement subcontractor. In bores > 20.0 ft deep, grout was tremied through 1.5-in. OD PVC tremie pipe at a depth of approximately 10.0 to 20.0 ft from the bottom of the bore. Grouting of boreholes ≤ 20.0 ft deep or where the danger of bridging was negligible was accomplished by pouring or by pumping grout through a short hose into the bore.

3.4 WASTE MANAGEMENT PRACTICES

A waste management plan for the plugging and abandonment program was supplied by Energy Systems (Appendix C). Because the majority of the abandonment sites were outside areas of known or suspected contamination, drilling cuttings and water were discharged to the ground surface or to an excavated cuttings pit, provided that field screening criteria for radiation, volatile organics, and pH were not exceeded.

In the event that drill cuttings exceeded acceptable disposal limits, Health, Safety, Environment, and Accountability Organization (HSEA) personnel directed subcontractor personnel in the proper disposal techniques.

Organic Vapors

A headspace analysis of the cuttings composite from well GW-660 measured in excess of acceptable disposal limits. After re-sealing the sample and allowing the appropriate incubation period (1-hr), the headspace was again analyzed, and again found to exceed the disposal limits. HSEA directed the oversight geologist to allow the cuttings to aerate overnight and resample the following day. A headspace analysis of a composite of the same cuttings the following day resulted in measurements that were in the acceptable range for on-site disposal. The source of the high headspace reading was not identified. The initial headspace analysis of the cuttings composite from well GW-007 exceeded the disposal limits. A headspace measurement of the same sample after re-sealing and a 1-hr incubation period fell within acceptable disposal limits. The source of the high headspace reading was not determined, and the cuttings were spread on the ground surface at the well location.

pH

A measure of the pH of the cuttings composites of many wells was in excess of acceptable disposal limits. In all cases, cement fragments/dust in the cuttings composite were identified as the source of the high pH. The wells in which a high pH was measured are as follows: B-1, GW-002, GW-007, GW-295, GW-448, GW-670, and LL/HAZ-14. In all cases, the cuttings were scattered around the well location with no further action taken.
3.5 DEVIATIONS FROM NORMAL PLUGGING AND ABANDONMENT PROCEDURES

Due to certain irregularities or unusual circumstances in the installation of the well to be decommissioned, deviations from the approved P&A methods were necessary to complete the P&A. Authorization to deviate from P&A methods was obtained from HSEA prior to beginning P&A activities. Generally, deviations of this type included: milling of PVC well casing/screen while simultaneously reaming the wellbore to fresh material, thereby streamlining the applicable P&A method; using bentonite aggregate instead of cement to bridge voids, cavities, or fractures; and abbreviating P&A activities at a well when removal of the well casing/screen was deemed impractical (either casing could not be extracted or waste generation was a concern).

The following is a list of deviations (other than the generalized ones listed above) that occurred during FY 1996:

1095

Procedures state that the wellbore be reamed to fresh material to a depth 1.0 ft beyond the total depth (TD) of the original wellbore. Reaming of well 1095 stopped approximately 2.0 ft short of the target depth due to a risk of getting the bit stuck.

GW-007

The casing (2 3/8-in. OD) in well GW-007 was being overwashed and the wellbore reamed to fresh material in one pass. Elevated organic vapors in the breathing zone during intrusive activities terminated the P&A of GW-007 prior to completion. The well casing and screen were extracted from the wellbore, which collapsed to the point where reaming terminated. The reamed borehole was plugged and capped in accordance with procedures.

GW-295

Well GW-295 was incompletely decommissioned. The surface casing had to be cut, leaving approximately 13.0 ft at the bottom of the borehole. The remainder of the P&A of well GW-295 was accomplished in accordance with procedures.

GW-297

As in the case of well 1095, the cased portion of well GW-297 was not reamed to the proper depth. Circulation was lost, and a risk of getting the hole opener stuck in the hole developed.

GW-721

In an effort to reduce waste, well GW-721 was decommissioned using nonintrusive methods. The casing/screen were pulled out of the ground, and the resulting hole plugged to 1.2 ft BGS using bentonite aggregate. The remaining hole was capped in accordance with procedures.

LL/HAZ-14

Well LL/HAZ-14 was completed in a reamed exploratory core hole. The well was incompletely decommissioned as the bit moved off of the well/wellbore while drilling/reaming, and recovery was impossible.
4. PLUGGING AND ABANDONMENT SUMMARIES

This section provides a brief P&A summary of each of the 27 wells decommissioned for the Y-12 Plant GWPP during FY 1996. The wells are arranged numerically within the same geographic region or operational area. A summary of the recorded well construction and location information is presented in Tables 4.1 and 4.2 (Jones, Thompson, and Field 1995, Y/TS-881/R3). Occasionally, minor differences existed between reported construction and actual construction. These differences, as well as deviations from the P&A procedures, are included below. Some wells had no listing in the Subsurface Data Base (Y/TS-881/R3). Some of the information for these wells reported in Tables 4.1 and 4.2 is based on field observations.

4.1 GUM BRANCH ROAD FUNCTIONAL AREA

The Gum Branch Road Functional Area (GBRFA) is located in west Bear Creek Valley, north of Bear Creek. The area is bounded on the west by Highway 95. The GBRFA has been and continues to be the site of several groundwater characterization studies for either research or proposed industrial purposes. A total of 7 wells were decommissioned from the GBRFA during FY 1996 due to obsolescence, lack of security and identity, or lack of construction records.

In addition, site evaluation to construct a low-level waste repository in the GBRFA is ongoing as one of several candidate sites. Wells that were plugged in the GBRFA during FY 1996 were done so, in part, because they could potentially impede construction of a facility.

GW-448

Well GW-448 was an obsolete PVC-screened well constructed in a 6 1/8-in. diameter borehole with a reported depth of 44.5 ft. The reported total depth of the substandard well was 44.3 ft, but a pre-P&A tag yielded a TD of 44.6 ft.

A 2.3-ft section of steel protective casing was removed after breaking up the concrete pad. The PVC well casing and screen were drilled up while the wellbore was reamed to fresh material using an 8 3/4-in. diameter tricone roller bit to a depth of 45.6 ft BGS. The reamed wellbore was grouted between 45.4 ft and 4.0 ft BGS by pumping 13, 94-lb sacks of neat, Type I Portland cement through 40.0 ft of PVC tremie pipe inserted to 38.0 ft BGS. The remaining 4.0 ft of the borehole was capped with clay soil.

GW-452

Well GW-452 was an obsolete PVC-screened well constructed in a 6 5/8-in. diameter borehole with a reported depth of 19.0 ft. The reported TD of the substandard well was 18.6 ft BGS (confirmed with a weighted tape prior to beginning P&A activities).

After the concrete pad had been broken up and removed, a 3.0-ft section of steel casing protecting the well casing stick-up was removed along with 2.0 ft of the well casing (which had come apart at a connection). The remaining PVC casing and screen were drilled up while the wellbore was reamed to fresh material using an 8 3/4-in. diameter tricone roller bit to a depth at 20.0 ft BGS. The reamed wellbore was grouted between 19.5 ft and 3.0 ft BGS by pouring 7, 94-lb sacks of neat, Type I Portland cement directly into the borehole. The remaining 3.0 ft of the borehole was capped with clay soil.
Table 4.1. Summary of decommissioned well construction data, Part Ia

<table>
<thead>
<tr>
<th>Well number</th>
<th>Y-12 Plant Coordinates</th>
<th>Surface elevation (ft MSL)</th>
<th>Total depth (ft BGS)</th>
<th>Functional area</th>
<th>Other names</th>
<th>Screened (S)</th>
<th>Open interval (O)</th>
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</thead>
<tbody>
<tr>
<td>1004</td>
<td>Northing 29732 Easting 50456</td>
<td>981.12</td>
<td>29.0</td>
<td>S3 Ponds</td>
<td>YGMW-03, YMW-09, AP-04</td>
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<tr>
<td>1095</td>
<td>Northing 28088 Easting 63601</td>
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<td>118.0</td>
<td>Sediment Disposal Basin</td>
<td>YGMW-21, SD-01, YSD-11</td>
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<tr>
<td>1096</td>
<td>Northing 27430 Easting 63553</td>
<td>1045.90</td>
<td>68.0</td>
<td>Sediment Disposal Basin</td>
<td>YGMW-22, SD-02, YSD-12</td>
<td>S</td>
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<tr>
<td>56-4C</td>
<td>Northing 29815 Easting 56804</td>
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<td>76.3</td>
<td>Y-12 Plant Site</td>
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<td>B-1b</td>
<td>Northing 28499 Easting 61702</td>
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<td>Urea Pile (East Chestnut Ridge)</td>
<td>MW-1</td>
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<td>B-3b</td>
<td>Northing 28519 Easting 61765</td>
<td>977.70</td>
<td>36.1</td>
<td>Urea Pile (East Chestnut Ridge)</td>
<td>MW-3</td>
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<td>GW-002</td>
<td>Northing 30294 Easting 47547</td>
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<td>Oil Landfarm</td>
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<td>GW-007</td>
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<td>16.5</td>
<td>Oil Landfarm</td>
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<td>GW-295</td>
<td>Northing 27802 Easting 62184</td>
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<td>Landfill III (East Chestnut Ridge)</td>
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<td>GW-297</td>
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<td>East Chestnut Ridge Waste Pile</td>
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<tr>
<td>GW-320</td>
<td>Northing 26253 Easting 57084</td>
<td>922.41</td>
<td>200.0</td>
<td>Ash Disposal Basin</td>
<td>None</td>
<td>S</td>
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<td>GW-321</td>
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<tr>
<td>GW-448</td>
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<td>872.20</td>
<td>44.5</td>
<td>Gum Branch Road area</td>
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<td>S</td>
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<tr>
<td>GW-452</td>
<td>Northing 29768.40 Easting 32589.50</td>
<td>872.90</td>
<td>19.0</td>
<td>Gum Branch Road area</td>
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<td>GW-660</td>
<td>Northing 32819 Easting 63543</td>
<td>875.3</td>
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<td>East Fork Poplar Creek</td>
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<td>GW-669</td>
<td>Northing 40249 Easting 50619</td>
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<td>GW-670</td>
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<tr>
<td>GW-671</td>
<td>Northing 40106 Easting 50605</td>
<td>830.1</td>
<td>8.9</td>
<td>East Fork Poplar Creek</td>
<td>AN: E-12</td>
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<td>GW-672</td>
<td>Northing 26269.06 Easting 57042.11</td>
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<td>28.0</td>
<td>Ash Disposal Basin</td>
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<td>S</td>
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<td>GW-721</td>
<td>Northing 31287.23 Easting 63157.62</td>
<td>1140.29</td>
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<td>East Pine Ridge</td>
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<tr>
<td>LL/HAZ-06</td>
<td>Northing 29770.43 Easting 32123.31</td>
<td>879.80</td>
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<td>None</td>
<td>S</td>
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<tr>
<td>LL/HAZ-11</td>
<td>Northing 30223.26 Easting 32138.85</td>
<td>931.30</td>
<td>33.0</td>
<td>Gum Branch Road area</td>
<td>None</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>LL/HAZ-12</td>
<td>Northing 30086.28 Easting 32124.05</td>
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<td>Gum Branch Road area</td>
<td>None</td>
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<tr>
<td>LL/HAZ-14c</td>
<td>Northing 30236.57 Easting 32157.15</td>
<td>932.47</td>
<td>350.0</td>
<td>Gum Branch Road area</td>
<td>None</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>P&amp;A 1</td>
<td>Northing 29920d Easting 28560d</td>
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<tr>
<td>P&amp;A 2</td>
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<td>Unknown/23.9</td>
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<td>S</td>
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<td>P&amp;A 3</td>
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<td>OR-04</td>
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<td>Gum Branch Road area</td>
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Table 4.1 (continued)

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<th>MSL</th>
<th>=</th>
<th>mean sea level</th>
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<tbody>
<tr>
<td>BGS</td>
<td>=</td>
<td>below ground surface</td>
</tr>
</tbody>
</table>

^Source: Jones, Thompson, and Field 1995

^Source: Ogden Environmental and Energy Services 1993

^Wellbore was originally an NX-core hole; completed as a monitoring well.

^Coordinates are approximate.

^Well OR-04 was not physically located in the field. The well was assumed destroyed.

Italicized entries indicate data obtained from field observations.
Table 4.2. Summary of decommissioned well construction data, Part II

<table>
<thead>
<tr>
<th>Well number</th>
<th>Protective Casing Depth/OD (ft,BGS/in.)</th>
<th>Surface Casing Type</th>
<th>Surface Casing Depth/OD (ft,BGS/in.)</th>
<th>TOWR (ft,BGS)</th>
<th>TOFR (ft,BGS)</th>
<th>Plugging and Abandonment Method</th>
<th>Rock Formation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1004</td>
<td>None</td>
<td>PVC/#40</td>
<td>29.0/6.5</td>
<td>12.0</td>
<td>27.0</td>
<td>C</td>
<td>Maynardville/Nolichucky</td>
</tr>
<tr>
<td>1095</td>
<td>None</td>
<td>PVC/#40</td>
<td>118.0/6.5</td>
<td>42.0</td>
<td>-NA-</td>
<td>C</td>
<td>Knox</td>
</tr>
<tr>
<td>1096</td>
<td>None</td>
<td>PVC/#40</td>
<td>68.0/6.5</td>
<td>60.0</td>
<td>-NA-</td>
<td>C</td>
<td>Knox</td>
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<tr>
<td>56-4C</td>
<td>None</td>
<td>PVC/#40</td>
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<tr>
<td>B-1d</td>
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<td>-NA-</td>
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<tr>
<td>B-3d</td>
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<td>GW-007</td>
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<td>123.0/10.75</td>
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<td>94.0</td>
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<td>-NA-</td>
<td>A</td>
<td>Knox</td>
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<td>GW-321</td>
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<td>-NA-</td>
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<td>GW-452</td>
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<td>GW-660</td>
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<td>8.4/2.37-in.</td>
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<td>A</td>
<td>Rome</td>
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<td>GW-669</td>
<td>3.1/6.62-in.</td>
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<td>-NA-</td>
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<td>7.1/12-in.</td>
<td>SS/#304</td>
<td>10.0/4.5-in.</td>
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<td>-NA-</td>
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<td>GW-671</td>
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<td>P&amp;A 2</td>
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Table 4.2 (continued)

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<th>Abbreviation</th>
<th>Description</th>
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<td>TOWR</td>
<td>Top of weathered rock</td>
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<tr>
<td>TOFR</td>
<td>Top of fresh rock</td>
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*aSource:* Jones, Thompson, and Field 1995  
*bDenotes surface casing for open-interval wells or well casing for screened interval wells  
*Depopth of contact given in parentheses  
*dSource:* Ogden Environmental and Energy Services 1993  
*eWellbore was originally an NX-core hole; completed as a monitoring well.  
*fWell OR-04 was not physically located in the field. The well was assumed destroyed.  

Italicized entries indicate data obtained from field observations.
LL/HAZ-06

Well LL/HAZ-06 was an obsolete PVC-screened well constructed in an 8.0-in. diameter borehole with a reported depth of 30.0 ft. The reported TD of the substandard well was also 30.0 ft BGS. Note: Prior to P&A activities on well LL/HAZ-06, site preparations necessitated the removal of approximately 2.0 ft of soil around the well collar. A pre-P&A tag of the well with a weighted tape resulted in the bottom of the well now being at 27.7 ft below current ground surface (BCGS).

The PVC casing and screen were milled while the wellbore was reamed to fresh material using an 8 3/4-in. diameter tricone roller bit to a depth of 29.1 ft BCGS. The reamed wellbore was grouted between 28.2 ft and 3.6 ft BCGS by pouring 9, 94-lb sacks of neat, Type I Portland cement directly into the borehole. The remaining 3.6 ft of the borehole was capped with clay soil.

LL/HAZ-11

Well LL/HAZ-11 was an obsolete PVC-screened well constructed in an 8.0-in. diameter borehole with a reported depth of 33.0 ft. A pre-P&A tag of the depth of the substandard well (32.6 ft BGS) indicated a small accumulation of sediment.

The PVC well casing and screen were milled while the wellbore was reamed to fresh material using an 8 1/2-in. diameter tricone roller bit to a depth of 34.3 ft BGS. The reamed wellbore was grouted from 34.3 ft to 1.3 ft BGS by pouring and pumping (through 30.0 ft of 1.5-in OD PVC tremie pipe inserted to 29.0 ft BGS) a total of 18, 94-lb sacks of neat, Type I Portland cement into the borehole. The remaining 1.3 ft of the borehole was capped with clay soil.

LL/HAZ-12

Well LL/HAZ-12 was an obsolete PVC-screened well constructed in an 8.0-in. diameter borehole with a reported depth of 35.0 ft. An apparent accumulation of sediment prevented confirmation of the total depth of the well (also reported to be 35.0 ft). A pre-P&A tag of 30.8 ft was measured.

The PVC casing and screen were milled while the wellbore was reamed to fresh material using an 8 3/4-in. diameter tricone roller bit to a depth of 36.3 ft BGS. The reamed wellbore was grouted from 31.0 to 3.0 ft BGS by pouring a total of 16, 94-lb sacks of neat, Type I Portland cement into the borehole. The remaining 3.0 ft of the borehole was capped with clay soil.

LL/HAZ-14

Well LL/HAZ-14 was originally an NX corehole that had been reamed to 6 1/8-in. diameter to serve as a monitoring well. The obsolete/substandard well had an unconfirmed reported depth of 349.0 ft.

An initial attempt to drill up the PVC well casing and screen using a 6 3/4-in. diameter tricone roller bit failed when the bit failed to stay on the well. The well casing and annular cement column were over washed from 0.0 ft to 40.6 ft BGS using 8 1/4-in. inside diameter (ID), 9 1/2-in. OD washover pipe. The well casing was drilled up while the wellbore was reamed to fresh material using a 7 7/8-in. diameter tricone roller bit. The boring was terminated at 74.9 ft BGS as the bit had again strayed from the wellbore.

The reamed wellbore was grouted from 71.0 ft to 2.2 ft BGS by pumping (through 70 ft of 1.5-in. OD PVC tremie pipe inserted to 67.0 ft BGS) and pouring a total of 26, 94-lb sacks of neat, Type I Portland cement into the borehole. The remaining 2.2 ft of the borehole was capped with clay soil.
OR-04

Well OR-04 was a well of unknown construction. A brief search for the well at its approximate location revealed no evidence of a well boring or casing stick-up. The well was assumed destroyed, and no further action taken.

P&A 1

Well P&A 1 was an unidentified PVC-screened well constructed in a borehole of unknown size and depth. The substandard well also lacked a locking mechanism to prevent unauthorized access. A pre-P&A tag with a weighted tape placed the bottom of the well at 22.0 ft BGS.

The PVC casing and screen were milled while the wellbore was reamed to fresh material using an 8 3/4-in. diameter tricone roller bit to a depth of 23.7 ft BGS. The reamed wellbore was grouted between 22.9 ft and 2.0 ft BGS by pouring 8, 94-lb sacks of Type I Portland cement directly into the borehole. The remaining 2.0 ft of the borehole was capped with clay soil.

P&A 2

Well P&A 2 was an unidentified PVC-screened well constructed in a borehole of unknown size and depth. The substandard well also lacked a locking mechanism to prevent unauthorized access. A pre-P&A tag with a weighted tape measured the bottom of the well at 23.9 ft BGS.

The PVC casing and screen were milled while the wellbore was reamed to fresh material using an 8 3/4-in. diameter tricone roller bit to a depth of 25.4 ft BGS. The reamed wellbore was grouted between 23.3 ft and 3.0 ft BGS by pouring 9, 94-lb sacks of neat, Type I Portland cement directly into the borehole. The remaining 3.0 ft of the borehole was capped with clay soil.

P&A 3

Well P&A 3 was an unidentified PVC-screened well constructed in a borehole of unknown size and depth. The substandard well also lacked a locking mechanism to prevent unauthorized access. A pre-P&A tag with a weighted tape measured the bottom of the well at 35.8 ft BGS.

The PVC casing and screen were milled while the wellbore was reamed to fresh material using an 8 3/4-in. diameter tricone roller bit to a depth of 36.9 ft BGS. The reamed wellbore was grouted between 31.8 ft and 2.0 ft BGS by pouring 9, 94-lb sacks of neat, Type I Portland cement directly into the borehole. The remaining 2.0 ft of the borehole was capped with clay soil.

4.2 EAST CHESTNUT RIDGE

The eastern end of Chestnut Ridge (located south of the Y-12 Plant) was the site of concentrated P&A efforts during FY 1996. The Sediment Disposal Basin, the Urea Pile, and the East Chestnut Ridge Waste Pile are all sites on Chestnut Ridge where at least one well was decommissioned during FY 1996. The Sediment Disposal Basin is located at the crest of the ridge near the easternmost edge of the Y-12 Plant. Wells 1095 and 1096 were located at this site. Piezometers B-1 and B-3 were installed in the Urea Pile, along the East Patrol Road, approximately midway between East Fork Poplar Creek, and the crest of Chestnut Ridge. Wells GW-295 and GW-297 were part of the East Chestnut Ridge Waste Pile monitoring networks, and were located near where the East Patrol Road crests Chestnut Ridge.

1095

Well 1095 was an obsolete PVC-screened well constructed in an 8.0-in. diameter borehole. The total reported depth of the substandard well was 118.0 ft; however, a pre-P&A tag of the bottom yielded a depth of 119.5 ft.

A total of 10.5 ft (including stick-up) of 6.5-in. OD PVC casing was removed from the borehole. The remaining PVC casing and screen were milled while the wellbore was reamed to
fresh material using an 8 1/2-in. diameter tricone roller bit to a depth of 117.0 ft BGS. The reaming was terminated short of the target depth due to lost circulation and the risk of getting the bit stuck.

A total of 53, 94-lb sacks of neat, Type I Portland cement were pumped into the reamed wellbore, but were apparently absorbed by large cavities in the bedrock interval. A plug of bentonite was formed between 40.6 ft and 26.0 ft BGS from 9, 50-lb sacks of 3/8-in. bentonite aggregate, hydrated. The wellbore was grouted between 26.0 ft and 3.7 ft BGS by pumping another 9, 94-lb sacks of neat, Type I Portland cement into the borehole. The remaining 3.7 ft of the borehole was capped with clay soil.

1096

Well 1096 was an obsolete PVC-screened well constructed in an 8.0-in. diameter borehole. The total reported depth of the substandard well (and confirmed by pre-P&A tag) was 68.0 ft.

The PVC well casing and screen were milled while the wellbore was reamed to fresh material using an 8 1/2-in. diameter tricone roller bit to a depth of 69.0 ft. The reamed wellbore was grouted from an unknown depth (abundant cuttings clinging to the borehole wall precluded an accurate tag of the bottom) to 1.3 ft BGS by pouring and pumping (through 30.0 ft of 1.5-in. OD PVC tremie pipe inserted to 29.0 ft BGS) a total of 25, 94-lb sacks of neat, Type I Portland cement into the borehole. The remaining 1.3 ft of the borehole was capped with clay soil.

B-1

Piezometer B-1 was constructed of PVC, and had been installed in an 8.0-in. diameter borehole with a depth of 53.2 ft. The obsolete piezometer, which was dry during most of the year, was screened between 6.0 ft and 21.0 ft BGS (the casing bottom had been confirmed using a weighted tape prior to P&A activities). The substandard piezometer had a locking cap, which was not functional to prevent unauthorized access.

The PVC casing and screen were milled while the wellbore was reamed to fresh material using an 8 3/4-in. diameter tricone roller bit to a depth of 54.3 ft BGS. Upon removal of the tools, a significant collapse of the borehole occurred. The reamed wellbore was grouted from 35.2 ft BGS (minor collapse of the borehole had occurred) to the ground surface by pumping 15, 94-lb sacks of neat, Type I Portland cement directly into the borehole.

B-3

Piezometer B-3 was constructed of PVC, and had been installed in an 8.0-in. diameter borehole with a depth of 36.1 ft. The obsolete piezometer, which was dry during most of the year, had a reported TD of 36.1 ft (a pre-P&A tag with a weighted tape measured the piezometer bottom at 35.8 ft BGS). The substandard piezometer had a locking cap, which was not functional to prevent unauthorized access.

The PVC casing and screen were milled while the wellbore was reamed to fresh material using an 8 3/4-in. diameter tricone roller bit to a depth of 37.5 ft BGS. The reamed wellbore was grouted from 35.2 ft BGS (minor collapse of the borehole had occurred) to the ground surface by pumping 15, 94-lb sacks of neat, Type I Portland cement into the borehole through 30.0 ft of PVC tremie pipe inserted to 29.0 ft BGS, and pouring another 6, 94-lb sacks of cement directly into the borehole.

GW-295

Well GW-295 was an obsolete well that was dry for most of the year. The stainless-steel well was reportedly installed in a 10.0-in. diameter borehole with a depth of 146.0 ft. The reported TD of the well was also 146.0 ft, but a pre-P&A tag with a weighted tape measured the bottom of the well at 146.7 ft BGS. The well also contained steel surface casing to a reported depth of 123.0 ft.
The well casing and screen were over washed using 5.0-in. ID, 6 1/2-in. OD washover pipe to a depth of 143.4 ft BGS, and removed. The completion interval of the well was reamed to fresh material using a 9 7/8-in. diameter tricone roller bit to a depth of 148.4 ft BGS. The reamed completion interval was grouted between 140.3 ft and 112.0 ft BGS by pumping 33, 94-lb sacks of neat, Type I Portland cement into the borehole through 140.0 ft of PVC tremie pipe inserted to 136.0 ft BGS. Note: The completion interval cement plug was later drilled out to 131.0 ft BGS.

The surface casing was over washed using 12-in. ID, 13 3/4-in. OD washover pipe to a depth of 111.9 ft BGS. At that point, over washing had become so slow (about 0.5 ft per day) that a decision was made to cut the casing off and proceed with the P&A of this well. The surface casing was cut off, and a total of 110.4 ft was recovered. The cased interval was reamed to fresh material using a 15.0-in. diameter hole opener to a depth of 107.5 ft BGS.

The initial attempt to grout the borehole failed when 4 cubic yds of delivered cement, when poured into the borehole, washed away into the formation. A plug was formed between 102.5 ft and 87.0 ft BGS by using 34, 50-lb sacks of 3/8-in. bentonite aggregate. The borehole was then plugged between 87.0 ft and 1.0 ft BGS by pouring a total of 8.0 cubic yds of delivered concrete directly into the borehole. The remaining 1.0 ft of the borehole was capped with clay soil.

GW-297

Well GW-297 was an obsolete well that was dry for most of the year. The stainless-steel well was reportedly installed in a 10.0-in. diameter borehole with a depth of 120.0 ft. The reported TD of the well was also 120.0 ft, but a pre-P&A tag with a weighted tape measured the bottom of the well at 120.7 ft BGS. The well also contained steel surface casing of an unknown amount (depth).

The well casing and screen were over washed using 4 1/2-in. ID, 6 1/2-in. OD washover pipe to a depth of 112.4 ft BGS, and removed. The completion interval of the well was reamed to fresh material using a 9 7/8-in. diameter tricone roller bit to a depth of 121.0 ft BGS. The reamed completion interval was grouted between 117.0 ft and 113.0 ft BGS by pumping 12, 94-lb sacks of neat, Type I Portland cement into the borehole through 120 ft of PVC tremie pipe inserted to 117.0 ft BGS. The reamed wellbore from 113.0 ft to 94.7 ft BGS was plugged by pouring 10, 50-lb sacks of 3/8-in. bentonite aggregate, and allowing to hydrate. Note: The hydrated bentonite was removed to a depth of 1015.0 ft BGS while over washing the surface casing.

The surface casing was over washed using 11 7/8-in. ID, 13 3/4-in. OD washover pipe to a depth of 105.0 ft BGS, and removed. The cased interval was reamed to fresh material using a 15-in. diameter hole opener to a depth of 67.9 ft BGS. At this point, down-hole conditions created the possibility of borehole collapse and subsequent loss of drill stem, so reaming was discontinued. A bentonite plug of 10, 50-lb sacks of 3/8-in. bentonite aggregate was placed on top of the fill remaining in the borehole from 44.1 ft to 41.8 ft BGS. The borehole was grouted between 41.8 ft and 2.9 ft BGS by pouring 4.0 cubic yds of delivered cement plus 17, 94-lb sacks of neat, Type I Portland cement directly into the borehole. The remaining 2.9 ft of the borehole was capped using a mixture of bentonite aggregate and clay soil.

4.3 ASH DISPOSAL BASIN

The Ash Disposal Basin (ADB) is located on the southern flank of Chestnut Ridge, west of Kerr Hollow Quarry. The ADB consists of a dammed impoundment situated in a shallow drainage valley, and was the collection site for the disposal of Y-12 Plant steam plant coal ash residue. Three stainless-steel screened wells located in the dam itself were decommissioned during FY 1996.

Wells GW-320, GW-321, and GW-672 were all located on a narrow bench near the middle of the dam. These three wells were decommissioned in preparation for a project to strengthen the dam and regrade some of the adjacent slopes.
GW-320

Well GW-320 was a stainless-steel screened well constructed in an 8.0-in. diameter borehole with a reported depth of 200.0 ft. The well screen was reportedly located between 100.0 ft and 110.0 ft BGS. The screened interval of the well was plugged using 2, 50-lb sacks of 3/8-in. bentonite aggregate from 110.3 ft to 91.6 ft BGS. The remaining casing was plugged from 91.6 ft to 1.0 ft below top of casing (BTOC) by pumping 8, 94-lb sacks of neat, Type I Portland cement through 1.0-in. ID PVC tremie pipe installed to 87.0 ft BGS into the well. The well casing and protective casing were removed flush with the ground surface.

GW-321

Well GW-321 was a stainless-steel screened well constructed in an 8.0-in. diameter borehole with a reported total depth of 98.6 ft BGS. The well screen was reportedly located between 98.0 ft and 87.3 ft BGS. The screened interval of the well was plugged from 98.4 ft (actual tagged depth) to 86.7 ft BGS using 1 1/2, 50-lb sacks of 3/8-in. bentonite aggregate. The remaining casing was plugged from 86.7 ft to the top of the casing using 6, 94-lb sacks of neat, Type I Portland cement through 1.0-in. ID PVC tremie pipe installed to 85.0 ft BGS into the well. The well casing and protective casing were removed flush with the ground surface.

GW-672

Well GW-672 was a stainless-steel screened well constructed in an 8.0-in. diameter borehole with a reported total depth of 28.0 ft. The well screen was reportedly located between 28.0 ft and 18.0 ft BGS. The screened interval of the well was plugged from 28.3 ft (actual tagged depth) to 13.1 ft BGS using 2, 50-lb sacks of 3/8-in. bentonite aggregate. The remaining casing was plugged from 13.1 ft to the top of the casing by pumping 2, 94-lb sacks of neat, Type I Portland cement into the well. The well casing and protective casing were removed flush with the ground surface.

4.4 LOWER EAST FORK POPLAR CREEK FLOODPLAIN

The Lower East Fork Poplar Creek (LEFPC) originates in the Y-12 Plant, and flows east and north toward the city of Oak Ridge through a water gap in Pine Ridge at Scarboro Road. The creek then flows alongside Illinois Avenue, and roughly parallel to the Oak Ridge Turnpike flowing west out of the city.

A number of shallow water table and bedrock wells had been installed within the LEFPC floodplain to investigate potential groundwater contamination in the vicinity of the creek. Several of these wells, located on private properties, were decommissioned during FY 1996.

GW-660

Well GW-660 was an obsolete stainless-steel screened well constructed in an 8 3/4-in. diameter borehole with a reported total depth of 11.0 ft. A 12.0-in. OD, 8 1/4-in. ID, hollow-stem auger was used to overdrill the 2 3/8-in. OD stainless steel well casing and screen and 6 5/8-in. OD steel conductor casing and ream the wellbore to fresh material to a depth of 11.6 ft BGS (auger refusal). The reamed wellbore was plugged from 8.3 ft to 1.3 ft BGS by pouring 7, 50-lb sacks of 3/8-in. bentonite aggregate into the borehole. The remaining 1.3 ft of hole was capped with clay soil.

GW-669

Well GW-669 was an obsolete stainless-steel screened well constructed in an 8 3/4-in. diameter borehole with a reported total depth of 9.4 ft. The 2 3/8-in. OD stainless steel well casing and screen were pulled out of the ground, along with 6 5/8-in. OD steel conductor casing. A 12.0-in. OD, 8 1/4-in. ID, hollow-stem auger was used to ream the wellbore to fresh material to a depth of 9.7 ft BGS (auger refusal). The reamed wellbore was plugged from 9.6 ft to 2.7 ft
BGS by pouring 6, 50-lb sacks of 3/8-in. bentonite aggregate into the borehole. The remaining 2.7 ft of hole was capped with clay soil.

GW-670

Well GW-670 was an obsolete stainless-steel screened well constructed in an 8 3/4-in. diameter borehole with a reported total depth of 21.8 ft. The 4 1/2-in. OD well casing and screen were over washed using 9.0-in. OD, 8.0-in. ID steel washover pipe, and removed. The wellbore was reamed to fresh material using a 9 7/8-in. diameter tricone roller bit to a depth of 22.9 ft BGS. The reamed completion interval was grouted from 22.9 ft to 5.2 ft BGS by pumping 7, 94-lb sacks of neat, Type I Portland cement into the borehole through 20.0 ft of 1.5-in. OD PVC tremie pipe inserted to 19.0 ft BGS.

The 12.0-in. OD steel surface casing was over washed using 13 1/4-in. OD, 12.0-in. ID steel washover pipe, and removed. The cased portion of the wellbore was reamed to fresh material using a 16.0-in. diameter hole opener to a depth of 8.3 ft BGS. The reamed cased interval was grouted from 8.3 ft to 3.6 ft BGS by pouring 5, 94-lb sacks of neat, Type I Portland cement directly into the borehole. The remaining 3.6 ft of hole was capped with clay soil.

GW-671

Well 671 was an obsolete stainless-steel screened well constructed in an 8 3/4-in. diameter borehole with a reported depth of 8.9 ft. The 2 3/8-in. OD stainless steel well casing and screen were pulled out of the ground, along with 6 5/8-in. OD steel conductor casing. A 12.0-in. OD, 8 1/4-in. ID, hollow-stem auger was used to ream the wellbore to fresh material to a depth of 8.8 ft BGS (auger refusal). The reamed wellbore was plugged from 8.7 ft to 3.4 ft BGS by pouring 6, 50-lb sacks of 3/8-in. bentonite aggregate into the borehole. The remaining 3.4 ft of hole was capped with clay soil.

4.5 MISCELLANEOUS SITES

During the FY 1996 P&A activities, a number of wells were decommissioned that were from single- or dual-well sites scattered throughout the Y-12 Plant property. This section provides a brief description of the P&A of each of these wells (including location), presented in numerical order. A total of four wells are summarized here.

1004

Well 1004 was located south of Bear Creek Road, in a small drainage down-gradient from the S3 Site cap. The obsolete PVC-screened well was constructed in an 8.0-in. diameter borehole with a reported depth of 29.0 ft. An apparent accumulation of sediment prevented confirmation of the total depth of the well (also reported to be 29.0 ft). A pre-P&A tag of 27.9 ft BGS was measured.

The PVC casing and screen were milled while the wellbore was reamed to fresh material using an 8 3/4-in. diameter tricone roller bit to a depth of 30.0 ft BGS. The reamed wellbore was grouted between 29.5 ft and 2.8 ft BGS by pumping 13, 94-lb sacks of neat, Type I Portland cement into the borehole through 30 ft of PVC tremie pipe inserted to 29.0 ft BGS. The remaining 2.8 ft of the borehole was capped with clay soil.

56-4C

Well 56-4C was located at the southeast corner of Building 9623 in the Y-12 Plant area. The casing stick-up had been broken off flush with the ground surface.

The well consisted of 4 1/2-in. OD PVC casing and screen installed to 76.3 ft BGS in a 6.0-in. diameter borehole. A 31.0-ft long section of 3 1/2-in. OD PVC casing had been inserted in the top of the well. A pre-P&A tag of the depth of the well resulted in a solid bottom at 73.4 ft.
The well casing and screen were plugged from 73.4 ft to 11.5 ft BGS using 3/8-in. bentonite aggregate. The remaining casing was plugged, from 11.5 ft to the ground surface, by pouring 1,94-lb sack of neat, Type I Portland cement into the well.

GW-002

Well GW-002 was located off the Haul Road, north of the Oil Landfarm (which is part of the Bear Creek Burial Grounds, west of the Y-12 Plant). The obsolete (upgradient) well was stainless steel, and had been installed in a 6.0-in. diameter borehole, 60.0 ft deep. The reported TD of the well was 57.7 ft, however, a pre-P&A tag with a weighted tape measured the bottom of the well at 59.8 ft BGS.

The steel conductor casing, along with most of the PVC surface casing and part of the stainless steel well casing was pulled out of the ground prior to P&A. The remaining well casing and screen were over washed using 5.0-in. ID, 6 1/2-in. OD washerover pipe to a depth of 62.2 ft BGS, and recovered. The wellbore was then reamed to fresh material using an 8 3/4-in. diameter tricone roller bit to a depth of 62.2 ft BGS. The reamed wellbore was grouted between 61.6 ft and 1.0 ft BGS by pumping 25, 94-lb sacks of neat, Type I Portland cement into the borehole through 61.0 ft of PVC tremie inserted to 60.0 ft BGS, then pouring another 3, 94-lb sacks of cement directly into the borehole. The remaining 1.0 ft of the borehole was capped with clay soil.

GW-007

Well GW-007 was also part of the Oil Landfarm monitoring network. The obsolete well located near the center of the Oil Landfarm, was stainless steel, and had been installed in a 6.0-in. diameter borehole with a reported depth of 16.5 ft. The reported TD of the well was 14.3 ft; a pre-P&A tag with a weighted tape to confirm the TD was not possible due to blockage within the casing.

The well casing, along with the steel conductor casing, was over washed (and the wellbore reamed to fresh material) using 8.0-in. ID, 9 1/4-in. OD washerover pipe to a depth of 9.3 ft BGS. At this depth, organic vapor levels in the breathing zone exceeded exposure criteria. Drilling operations were suspended and P&A of the well in place was authorized after organic vapor levels dropped below screening criteria.

A total of 19.6 ft of stainless steel well materials (casing, screen, and silt trap) were removed from the borehole. The reamed wellbore was grouted between 9.3 ft and 2.4 ft BGS by pouring 4, 94-lb sacks of Type I Portland cement directly into the borehole. The remaining 2.4 ft of the borehole was capped with clay soil.

GW-721

Well GW-721 was located in the Water Treatment Facility complex at the east end of Pine Ridge. The obsolete well had been a recovery well for contaminated groundwater related to a nearby underground fuel tank. The PVC well was constructed in a 22.0-in. diameter borehole, 8.0 ft deep, whose annulus was sealed with bentonite.

The PVC screen and casing were pulled out of the ground. The borehole left by the extracted well was plugged between 4.5 ft and 1.2 ft BGS by pouring 4, 50-lb sacks of 3/8-in. bentonite aggregate into the borehole and allowing to hydrate. The remaining 1.2 ft of the borehole was capped with clay soil.
5. QUALITY ASSURANCE

Quality control was closely monitored during all P&A activities to ensure that P&A activities conformed to Energy Systems P&A procedures (Energy Systems 1994). All task-related activities were observed and documented by a registered professional geologist employed by SAIC. Any deviations were approved by the GWPP Manager or designee. Drill rigs and all ancillary drilling equipment were steam cleaned before drilling operations at each site.* During P&A operations, equipment was routinely inspected for fuel and oil leaks, and a spill control kit was present during each abandonment.

Plastic sheeting and straw bale berms were used to contain normal drilling cuttings and water when abandonment activities occurred near surface waters. Only vegetable-oil-based or nonpetroleum thread lubricant (Well-Guard™ – a beeswax-based thread lubricant) was used when needed during drilling.

At times when cuttings were circulated and available for collection, these were sampled continuously over 10.0- to 20.0-ft intervals. All samples were screened and inspected for comparison with expected well and boring materials.

*Energy Systems personnel initiated the use of a new form, Equipment Decontamination Inspection Summary, in 1994 to be included with all P&A well reports. This form documents the steam cleaning and inspection of all equipment prior to use at each location.
6. HEALTH AND SAFETY

A Health and Safety Plan (SAIC 1992) was followed for all FY 1996 P&A activities. All on-site personnel were in compliance with training requirements mandated by 29 CFR 1910.120, and all were enrolled in an annual health screening and occupational medical examination program. Additionally, all personnel present on site during P&A activities wore thermoluminescent dosimeter badges collected and monitored by Energy Systems. During the period of work covered by the annual report, no personnel received radiation exposure exceeding permissible limits based on field screening. Low potential for exposure to hazardous materials at all work sites allowed use of Level D personal protection. This protective level consisted of not less than steel-toed footwear, gloves, hard hats, hearing protection in the form of plugs or muffs, and safety glasses.

Technical oversight personnel provided health and safety monitoring at the work sites using monitoring equipment supplied and maintained by Energy Systems. Instrumentation used on site typically consisted of an HNu Model HW-101 photoionization detector (PID), a Foxboro Century™ organic vapor analyzer (OVA) Model 108 or Model 128 flame ionization detector (FID), and Ludlum radiation meters. The HNu PID and OVA FID were used to detect ionizable organic vapors. Radiation detection instruments included a Ludlum Model 3 Survey Meter for detection of beta and gamma radiation with a Geiger-Mueller “pancake” type probe. Alpha radiation was monitored using a Ludlum Model 12 Count Ratemeter with a scintillation tube probe or an air probe.

In addition to screening for health and safety, drilling returns were screened per Energy Systems guidelines in a general waste management plan for drilling activities (Appendix C). This daily screening consisted of alpha, beta, and gamma radiation screening of composited drill cuttings. A headspace analysis of organic vapors and a pH measurement were also performed on this composited cuttings sample. Because grout cuttings often were a significant component of drilling returns during over washing and borehole reaming, pH levels sometimes exceeded the upper bounds of waste screening criteria. If grout cuttings were present, as identified visually, and no screening parameters other than pH exceeded guideline criteria, then no containment actions were taken. Screening results are contained in Appendix D.

Health and safety plan action levels (SAIC 1992) and waste management guideline values used during P&A activities are presented in Table 6.1.

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<td>Radiation</td>
<td>&gt;2 millirem/hr, and/or an 8-hr time-weighted average of 0.25 millirem/hr at chest level</td>
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7. REFERENCES


APPENDIX A
ACTIVITY/PROGRESS REPORTS
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

#### WELL PLUGGING AND ABANDONMENT

**ACTIVITY/PROGRESS REPORT**

**LOCATION:** S3 Ponds

**DRILLER:** H. Hall - Highland Drilling Co.

**HELPERS:** R. Phillips/J. Gallaher - Highland Drilling Co.

**DRILL:** Ingersoll-Rand XL-750

**DATE:** START: 9-5-95

**FINISH:** 9-7-95

**METHOD:** 

**LOGGED BY:** Timothy Coffey - SAIC

**WELL NO.** 1004

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-5-95</td>
<td>1117</td>
<td>Arrive at well 1004 site. Move drill rig onto location. Wellhead is open but has remnants of a yellow wooden box on it. Measure water level at 10.8 ft BGS. Tag bottom of well (soft) at 27.9 ft BGS (apparent sediment accumulation in bottom). Note: The Subsurface Data Base (YTS-8811/R2) reports the TD of well 1004 to be 29.0 ft BGS. Background radiological scan of location: alpha = 0 cpmp, beta/gamma = 50 cpm. Cut off protective posts surrounding the well.</td>
</tr>
<tr>
<td>9-5-95</td>
<td>1145</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td>1221</td>
<td>1255</td>
<td>Position the drill rig over the well. Cut off 2.1 ft of the 6 5/8-in. outside diameter (OD) PVC casing stick-up. Raise the mast.</td>
</tr>
<tr>
<td>1255</td>
<td>1259</td>
<td>Rig up with an 8 3/4-in. diameter tricone bit on a subadapter; total length = 4.3 ft, table height = 2.4 ft.</td>
</tr>
<tr>
<td>1259</td>
<td>1333</td>
<td>Commence drilling up the casing/reaming the wellbore using compressed air only. Drill/ream from 0.0 ft to 30.0 ft BGS. Encounter moisture (with a stale/musty odor) at 3.8 ft BGS. Breathing zone analysis (BZA) = 0.0 ppm. Cuttings from 0.0 ft to 3.8 ft BGS consist of medium dark gray (N4) to medium light gray (N6) cement fragments; pale yellowish-brown (10YR 6/2), dry clay (soil); and white (N9) PVC fragments. Begin to see sand (filter pack) in returns at 5.5 ft BGS. Sand is wet at 9.5 ft BGS. Encounter water at 10.5 ft BGS. BZA at 11.9 ft BGS = 0.0 ppm.</td>
</tr>
</tbody>
</table>
## Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

### WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-5-95 (cont.)</td>
<td>1333</td>
<td>1339</td>
</tr>
<tr>
<td>1339</td>
<td>1357</td>
<td>Shut off drill rig. Wait for water to accumulate in borehole to aid in cleaning.</td>
</tr>
<tr>
<td>1357</td>
<td>1403</td>
<td>Rig on, continue cleaning borehole.</td>
</tr>
<tr>
<td>1403</td>
<td>1430</td>
<td>Trip out tools. Tag bottom of borehole at 29.5 ft BGS (0.5 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 10.7 cubic ft, equivalent to 9.1 sacks of Type I cement. Lower mast. Move drill rig off location. Secure site and depart.</td>
</tr>
<tr>
<td>9-6-95</td>
<td>0830</td>
<td>0842</td>
</tr>
<tr>
<td>0842</td>
<td>0923</td>
<td>Mix and pump-tremie (with grout plant) 13 sacks (15.3 cubic ft) of neat, Type I Portland cement (average grout weight of 14.4 lbs/gal) into the borehole. Circulate water, then 100% cement.</td>
</tr>
</tbody>
</table>
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

#### WELL NO. 1004

**WELL PLUGGING AND ABANDONMENT**

**ACTIVITY/PROGRESS REPORT - continued**

<table>
<thead>
<tr>
<th>DATE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>9-6-95</td>
<td>0923</td>
<td>Pull out tremie pipe. Clean up. Secure site and depart.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-7-95</td>
<td>0824</td>
<td>At 1004 site. Tag cement level at 2.8 ft BGS. Cap remaining borehole with clay soil.</td>
</tr>
<tr>
<td></td>
<td>0829</td>
<td></td>
</tr>
</tbody>
</table>

P&A of well 1004 is complete.
<table>
<thead>
<tr>
<th>DATE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2-28-96</td>
<td>1017</td>
<td>Move drill rig onto 1095 site and position over the well. Set up the site. Uncap the well: organic vapors in the casing headspace = 0.0 ppm. Measure water level in well at 71.2 ft below ground surface (BGS). Tag bottom of well (solid) at 119.5 ft BGS. Note: the Subsurface Data Base (Y/TS-881/R3) reports the total depth of well 1095 to be 118.0 ft. Background radiological scan of location: beta/gamma = 60-70 cpm, no alpha (too wet).</td>
</tr>
<tr>
<td>1108</td>
<td>1108</td>
<td>Raise the mast. Break up the concrete pad and remove the fragments. Attach a jawed clamp to the casing stick-up and attempt to pull out; the casing comes out fairly easily. Extract a total of 10.5 ft of 6-in. inside diameter (ID), schedule 40 PVC casing (includes the stick-up), casing had pulled out of a connection.</td>
</tr>
<tr>
<td>1121</td>
<td>1130</td>
<td>Push in a 3.7-ft section of 10 3/4-in. outside diameter (OD), 10 1/8-in ID steel conductor casing; casing stick-up = 0.4 ft.</td>
</tr>
<tr>
<td>1130</td>
<td>1135</td>
<td>Rig up with an 8 1/2-in. diameter tricone bit on a subadaptor; length = 20 ft, table height = 2.8 ft. Add a 25-ft drill rod.</td>
</tr>
<tr>
<td>1135</td>
<td>1220</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td>1220</td>
<td>1413</td>
<td>Commence drilling up the casing while reaming the wellbore. Drill/ream from 0.0 ft to 81.2 ft BGS using compressed air only. Breathing zone analysis (BZA) at 4.2 ft BGS = 0.0 ppm. Cuttings from 0.0 ft to 5.0 ft BGS consist of moderate brown (5YR 4/4) to selections.</td>
</tr>
</tbody>
</table>
### Activity/Progress Report - continued

<table>
<thead>
<tr>
<th>DATE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2-28-96</td>
<td></td>
<td>dark yellowish-brown (10YR 4/2), moist, clayey soil and medium light gray (N6) cement fragments. Encounter moisture at 8.2 ft BGS. BZA at 14.0 ft BGS = 0.0 ppm. Encounter a small void at approximately 21 ft BGS. BZA at 29.5 ft BGS = 1.0 ppm (maximum), 0.2 ppm (sustained). Lower explosive limit (LEL) reading at 34.0 ft BGS &lt;1% (2.8 ppm). Plenty of rig chatter in this area (chert lenses). BZA at 44.2 ft BGS = 0.0 ppm. Top of bedrock at 49.2 ft BGS. Cuttings from 5.0 ft to 49.2 ft BGS are light brown (5YR 5/6), moist to wet, plastic clay with rare residual chert; minor cement fragments; and PVC fragments. LEL reading at 53.7 ft BGS &lt;1% (4.7 ppm). Encounter more moisture at 63.5 ft BGS. BZA at 64.2 ft and 78.6 ft BGS read 0.2 ppm and 0.0 ppm, respectively. Using water to drill with beginning at 64.8 ft BGS. Cuttings from 49.2 ft to 81.2 ft BGS consist primarily of white (N9) PVC fragments and dark gray (N3), massive, pelletal micrite with minor opaque and dark and light gray (N3-N7) banded chert.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1413</td>
<td>1510</td>
<td>At 81.2 ft BGS. Trip out tools to the previous connection; shut off the drill rig, nearly out of fuel. Crew arrives, fuel drill rig.</td>
</tr>
<tr>
<td>1510</td>
<td>1549</td>
<td>Rig back on, trip back into bore and continue drilling up casing while reaming the wellbore. Drill/ream casing from 81.2 ft to 109.6 ft BGS using compressed air and water. BZA at 94.0 ft and 107.0 ft BGS both read 0.0 ppm. Alternating hard and soft drilling this interval. Cuttings from 81.2 ft to 109.6 ft BGS are a continuation of above, plus beginning to see abundant quartz &quot;pea&quot; gravel in last half of the interval (filter pack?). Beta/gamma scan of cuttings range from 50 to 70 cpm for the entire interval.</td>
</tr>
<tr>
<td>1549</td>
<td>1610</td>
<td>At 109.6 ft BGS. Clean out the borehole. Trip tools out to 49.2 ft BGS (stuck temporarily at 84.5 ft BGS). Out of water. Winterize drill rig. Secure site and depart.</td>
</tr>
</tbody>
</table>

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**Note:** All values and activities are approximate and subject to change based on field conditions and operational requirements.
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

#### WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

<table>
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<tr>
<th>DATE</th>
<th>TIME</th>
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</thead>
<tbody>
<tr>
<td>2-29-96</td>
<td>0840</td>
<td>Arrive at 1095 site. Conduct pre-work equipment inspections. Drill rig won't start without ether; proceed to get some. Drill rig won't start without jumper cables; proceed to get jumper cables.</td>
</tr>
<tr>
<td></td>
<td>0937</td>
<td></td>
</tr>
<tr>
<td>0937</td>
<td>1008</td>
<td>Drill rig starts; warming up. Trip tools back into borehole; water level at 89.0 ft BGS.</td>
</tr>
<tr>
<td>1008</td>
<td>1022</td>
<td>Bit on bottom, continue drilling up casing while reaming wellbore. Drill/ream from 109.6 ft BGS to approximately 117.0 ft BGS. Lose circulation almost immediately, almost no returns during the interval. BZA at 115.0 ft BGS = 5 ppm (residual alcohol anti-freeze effects).</td>
</tr>
<tr>
<td>1022</td>
<td>1050</td>
<td>At 117.0 BGS. Driller is concerned about getting the bit stuck. Trip out tools. Stuck momentarily at 47.0 ft BGS. Call K. Jago (HSEA), report status. Request to use soap to clean the borehole is denied. Kevin directs crew to grout borehole as is. Bit out of the ground, tag borehole; borehole is obstructed at 38.0 BGS. Will not try to clean the borehole anymore.</td>
</tr>
<tr>
<td>1050</td>
<td>1129</td>
<td>Run 1.5-in. OD PVC tremie pipe into the borehole; it also stops at 38 ft BGS. Plan to grout one borehole volume. Calculate a borehole volume from 117.0 ft to ground surface of 45.6 cubic ft, equivalent to 38.7 sacks of Type I cement. Remove the bit, rack the rods, and lower the mast.</td>
</tr>
<tr>
<td>1129</td>
<td>1205</td>
<td>Crew goes to get water for grout.</td>
</tr>
<tr>
<td>1205</td>
<td>1238</td>
<td>Crew returns. Break for lunch.</td>
</tr>
<tr>
<td>1238</td>
<td>1435</td>
<td>Mix and pump-tremie 35 sacks (41.3 cubic ft) of neat, Type I Portland cement (average grout weight of 13.2 lbs/gal) into the borehole.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>--------</td>
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<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2-29-96</td>
<td>1435</td>
<td>Pull out tremie pipe. Clean up. Depart site.</td>
</tr>
<tr>
<td>(cont)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-1-96</td>
<td>1013</td>
<td>At 1095 site. Tag cement level; tape stops on something solid (possibly a large fragment of PVC casing) at 40.6 ft BGS. Calculate a borehole</td>
</tr>
<tr>
<td></td>
<td>1019</td>
<td>volume to 4.0 ft BGS of 14.3 cubic ft, equivalent to 12.1 sacks of Type I cement. Run 1.5-in. OD PVC tremie pipe into the borehole to 29.0 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1019</td>
<td>Mix and pump-tremie 18 sacks (21.2 cubic ft) of neat, Type I Portland cement (average grout weight of 13.0 lbs/gal) into the borehole.</td>
</tr>
<tr>
<td></td>
<td>1203</td>
<td>Pull out tremie pipe. Clean up. Depart site.</td>
</tr>
<tr>
<td>3-4-96</td>
<td>0731</td>
<td>At 1095 site. Tag cement; tape again stops at 40.6 ft BGS. Depart site. Report status to HSEA who directs to form a plug of bentonite aggregate,</td>
</tr>
<tr>
<td></td>
<td>0737</td>
<td>then grout the remaining borehole.</td>
</tr>
<tr>
<td></td>
<td>0908</td>
<td>Return to 1095 site. Slowly pour 9, 50-lb sacks of 3/8-in. bentonite aggregate into the borehole. Unhydrated bentonite level at 26.2 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>0915</td>
<td>Pour approximately 50 gallons of water into the borehole to hydrate the bentonite. Depart site. Bentonite to hydrate a minimum of 4 hours.</td>
</tr>
<tr>
<td></td>
<td>1405</td>
<td>Return again to 1095 site. Tag hydrated bentonite at 26.0 ft BGS (bentonite swelled 0.2 ft). Calculate a borehole volume to 4.0 ft BGS of 8.6</td>
</tr>
<tr>
<td></td>
<td>1440</td>
<td>cubic ft, equivalent to 7.3 sacks of Type I cement. Mix and pump-tremie 9 sacks (10.6 cubic feet) of neat, Type I Portland cement (grout weight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>of 13.2 lbs/gal) into the borehole using the pump discharge hose as the tremie. Liquid cement fills the borehole to 0.5 ft BGS. Clean up. Depart site.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
</tr>
<tr>
<td>-------</td>
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</tr>
<tr>
<td>3-5-96</td>
<td>0750</td>
<td>At 1095 site. Tag cement level at 3.7 ft BGS. Cap remaining borehole with clay soil.</td>
</tr>
<tr>
<td></td>
<td>0803</td>
<td></td>
</tr>
</tbody>
</table>

P&A of well 1095 is complete.
**WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT**

**LOCATION:** Sediment Disposal Basin  
**DRILLER:** R. Phillips - Highland Drilling Co.  
**HELPERS:** H. Hall - Highland Drilling Co.  
**DRILL:** Ingersoll-Rand T4W  
**DATE:** START: 2-27-96  
**FINISH:** 3-4-96  
**METHOD:** C  
**LOGGED BY:** Timothy Coffey - SAIC

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>2-27-96</td>
<td>0859</td>
<td>Arrive at 1096 site. The drill rig is on site, already positioned over the well. Uncap well: organic vapors in casing headspace = 0.0 ppm. Measure water level at 64.3 ft below ground surface (BGS). Tag bottom of well (solid) at 68.0 ft BGS (reported depth). Background radiological scan of the location: alpha = 0 cpm, beta/gamma = 40-60 cpm.</td>
</tr>
<tr>
<td>0929</td>
<td>0945</td>
<td>Crew arrives with water supply; move it onto location. Conduct pre-work equipment inspections.</td>
</tr>
<tr>
<td>0945</td>
<td>1014</td>
<td>Dig around the base of the casing stick-up, break up concrete pad, and remove fragments. Break off the casing flush with the ground surface. Push in a 3.7-ft section of 10 3/4-in. outside diameter (OD), 10 1/8-in. inside diameter (ID) steel conductor casing; casing stick-up = 0.6 ft.</td>
</tr>
<tr>
<td>1014</td>
<td>1022</td>
<td>Rig up with an 8 1/2-in. diameter tricone bit on a subadapter; length = 2.0 ft, table height = 3.1 ft. Add a 25-ft drill rod.</td>
</tr>
</tbody>
</table>
| 1022 | 1131 | Commence drilling up the casing while reaming the wellbore. Drill/ream from 0.0 ft to 69.0 ft BGS using compressed air only. Breathing zone analysis (BZA) at 3.9 ft BGS = 0.1 ppm. Cuttings from 0.0 ft to 3.9 ft BGS consist of moderate brown (5YR 4/4), moist, clayey soil; white (N9) PVC fragments; and medium gray (N5) cement fragments. BZA at 12.9 ft BGS = 0.6 ppm (maximum), 0.2 ppm (sustained). Lower explosive limit (LEL) reading at
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

**WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued**

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<tr>
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</thead>
<tbody>
<tr>
<td>2-27-96</td>
<td>1200</td>
<td><strong>18 ft BGS &lt;1% (5.4 ppm). BZA at 28.9 ft BGS = 0.0 ppm. LEL reading at 33.9 ft BGS &lt;1% (6.5 ppm). Possible lithology change at 40.9 ft BGS (from fill to natural clay). Cuttings from 3.9 ft to 40.9 ft BGS are light brown (5YR 5/6), moist to sticky, plastic clay with rare white (N9) and medium dark gray (N4) residual chert; and white (N9) PVC fragments. BZA at 43.4 ft BGS = 0.5 ppm (maximum), 0.3 ppm sustained. Small void from 45.9 ft to 46.9 ft BGS. Large void 48.9 ft to 59.0 ft BGS (drill rods free-falling). BZA at 53.9 ft BGS = 0.0 ppm. Top of bedrock at 59.0 ft BGS. Cuttings from 40.9 ft to 45.9 ft BGS and 46.9 ft to 48.9 ft BGS are light brown (5YR 5/6) to moderate brown (5YR 4/4), moist clay with residual chert (as above); and PVC fragments. BZA at 63.9 ft BGS = 0.2 ppm. Bedrock was drilled from 59.0 ft to 69.0 ft BGS, but no obvious rock fragments returned; circulation is spotty. Beta/gamma scan of cuttings range from 40 to 70 cpm for the entire interval.</strong></td>
</tr>
<tr>
<td>2-27-96</td>
<td>1314</td>
<td><strong>At 69.0 ft BGS. Clean out borehole: very sticky clay, clinging to borehole walls. Trip out tools. Tag bottom of borehole; tape reaches to only 50.0 ft BGS. Much clay still remains on borehole walls.</strong></td>
</tr>
<tr>
<td></td>
<td>1205</td>
<td><strong>Break for lunch.</strong></td>
</tr>
<tr>
<td>1235</td>
<td>1314</td>
<td><strong>Run 1.5-in. OD PVC tremie pipe into the borehole to try and breach the obstruction; it also stops at 50 ft BGS. Remove tremie pipe.</strong></td>
</tr>
<tr>
<td>1314</td>
<td>1350</td>
<td><strong>Trip tools back into borehole, clean out borehole again. Trip out. Tag bottom of borehole; tape reaches only to 34.0 ft BGS (lost some hole in cleaning the borehole). Further cleaning may result in the loss of more hole. Plan to grout the borehole now.</strong></td>
</tr>
<tr>
<td>DATE</td>
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<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2-27-96</td>
<td>1350</td>
<td>Run the PVC tremie pipe back into the borehole to 29.0 ft BGS.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1414</td>
<td>Calculate a borehole volume from 34.0 ft to 4.0 ft BGS of 11.7 cubic ft, equivalent to 9.9 sacks of Type I cement.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mix and pump-tremie 14 sacks (26.4 cubic ft) of neat, Type I Portland cement (average grout weight of 13.0 lbs/gal) into the borehole.</td>
</tr>
<tr>
<td></td>
<td>1453</td>
<td>Pull out tremie pipe (liquid cement coats the bottom 5 ft of the tremie). Clean up. Pull out conductor casing, lower mast, and pull drill rig away from the borehole. Depart site.</td>
</tr>
<tr>
<td>2-29-96</td>
<td>1435</td>
<td>At 1096 site. Tag cement level at 32.0 ft BGS. Cement has obviously filtered down through partial clay cuttings obstruction to unknown depth. Calculate a borehole volume to 4.0 ft BGS of 10.9 cubic ft, equivalent to 9.3 sacks of Type I cement. Run 1.5-in. OD PVC tremie pie into borehole to 29.0 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1454</td>
<td>Mix and pump-tremie 10 sacks (11.8 cubic ft) of neat, Type I Portland cement (average weight of 13.1 lbs/gal) into the borehole to approximately 1 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1539</td>
<td>Pull out tremie pipe. Clean up. Depart.</td>
</tr>
<tr>
<td>3-1-96</td>
<td>0954</td>
<td>At 1096 site. Tag cement level at 5.0 ft BGS. Mix 1 sack of Type I cement and pour into borehole. Liquid cement fills the borehole to 0.5 ft BGS. Depart site.</td>
</tr>
<tr>
<td></td>
<td>1010</td>
<td>P&amp;A of well 1096 is complete.</td>
</tr>
<tr>
<td>3-4-96</td>
<td>0918</td>
<td>At 1096 site. Tag cement level at 1.3 ft BGS. Cap remaining borehole with clay soil. Depart.</td>
</tr>
<tr>
<td></td>
<td>0923</td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
</tr>
<tr>
<td>-----------</td>
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<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1-24-96</td>
<td>0934</td>
<td>Arrive at 56-4C site. Oversight gives site-specific Health and Safety briefing to the crew.</td>
</tr>
</tbody>
</table>
|           | 0940  | Well 56-4C is to be decommissioned because of damage to the wellhead: the casing stick-up had been snapped off flush with the ground surface. Background radiological scan of the location:  
alpha = 0 cpm, beta/gamma = 40 cpm. Measure organic vapors in breathing zone around well: 0.0 ppm, inside casing headspace:  
0.0 ppm. Well consists of 3-in. inside diameter (ID), 3 1/2-in. outside diameter (OD) PVC casing in what appears to be an approximately 7-in. diameter borehole. Measure water level at 7.8 ft below ground surface (BGS). Tag bottom of well (solid) at 73.4 ft BGS. Note: The subsurface data base (Y/TS-881/R3) reports the total depth of well 56-4C at 76.3 ft. |
|           | 0948  | Slowly pour 4, 50-lb sacks of 3/8-in. bentonite aggregate into the well. The water level rises to approximately 1 ft BGS. The bentonite is at 32.7 ft BGS. K. Jago-HSEA had directed that no water was to circulate out of the well onto the ground. |
| 1007      | 1007  | Wait for water level to drop. Discover that the well is actually constructed of 4-in. ID PVC casing, but has a 3.1-ft section of the 3-in. casing at the top.                                                           |
| 1037      | 1037  | Water level is at approximately 5 ft BGS. Slowly pour about 1/2 of a 50-lb sack of 3/8 in. bentonite aggregate into the well until the                                                                                 |
### Activity/Progress Report - continued

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>START</th>
<th>FINISH</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-24-96</td>
<td></td>
<td></td>
<td></td>
<td>water level returns to 1.0 ft BGS. Bentonite level is now at 27.5 ft BGS.</td>
</tr>
<tr>
<td>(cont.)</td>
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<tr>
<td>1040</td>
<td>1131</td>
<td></td>
<td></td>
<td>Wait again for water level to drop. Water level remains at 1.0 ft BGS. Bentonite level remains at 27.5 ft BGS. Cover wellhead and depart.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Report status to K. Jago (HSEA) who directs to let well sit overnight for water level to drop.</td>
</tr>
<tr>
<td>1-25-96</td>
<td>0730</td>
<td>0736</td>
<td></td>
<td>At 56-4C site. Water level in well remains at 1.0 ft BGS, and bentonite level remains at 27.5 ft BGS. Depart site.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Report status to K. Jago (HSEA) who directs to pump water out of the well and dispose of in purge water drum at 55-6A site. Continue decommissioning 56-4C as planned.</td>
</tr>
<tr>
<td></td>
<td>0913</td>
<td>0926</td>
<td></td>
<td>Return to 56-4C site with crew. Begin bailing water out of the well. Bail 5 gallons of water out of the well.</td>
</tr>
<tr>
<td></td>
<td>0926</td>
<td>0930</td>
<td></td>
<td>Slowly pour 1, 50-lb sack of 3/8-in. bentonite aggregate into the well.</td>
</tr>
<tr>
<td></td>
<td>0930</td>
<td>0937</td>
<td></td>
<td>Bail another 5 gallons of water out of the well.</td>
</tr>
<tr>
<td></td>
<td>0937</td>
<td>0940</td>
<td></td>
<td>Pour approximately 1/2 of a 50-lb sack of 3/8-in. bentonite aggregate into the well. Bentonite level is at 11.5 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>0940</td>
<td>0952</td>
<td></td>
<td>Bail 3 more gallons of water out of the well. Calculate a well volume from 11.5 ft to the ground surface of 1.0 cubic ft., equivalent to 0.9 sacks of Type I cement.</td>
</tr>
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<td>DATE</td>
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<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>1-25-96</td>
<td>0952</td>
<td>Mix and pour 1 sack (1.2 cubic ft) of neat, Type I Portland cement into the well. Cement fills the well to the ground surface.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(cont.)</td>
<td>1004</td>
<td>Clean up, secure site, and depart.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1004</td>
<td>1007</td>
<td>P&amp;A of well 56-4C is complete.</td>
<td></td>
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</tr>
</tbody>
</table>

Note: No intrusive work was performed in the decommissioning of this well hence no Cuttings Field Screening/Disposal Sheet or Equipment Decontamination Summary was required.
ORNL-DWG 90M-13756

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. B-1

WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT

LOCATION: Urea Pile (East Chestnut Ridge)

DRILLER: H. Hall - Highland Drilling Co.

DRILL: Ingersoll-Rand T4W

DATE: START: 9-22-95
FINISH: 9-22-95
METHOD: C
LOGGED BY: Timothy Coffey - SAIC

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-22-95</td>
<td>0754 0857</td>
<td>Arrive at B-1 site. Drill rig already on location, positioned over the piezometer. Piezometer consists of 2-in. inside diameter (ID) PVC casing (stick-up of 0.6 ft) in a grouted, apparently 8-in. diameter borehole. Measure water level; none, piezometer is dry. Tag bottom of piezometer at 21.2 ft below ground surface (BGS). Note: The original well log indicates that the piezometer (with a total depth of 21.0 ft) was installed in a borehole that had been drilled to 53.2 ft. Background radiological scan of location: Beta/gamma = 40 cpm (no alpha - wet). Crew arrives and conducts pre-work equipment inspections.</td>
</tr>
<tr>
<td>0857</td>
<td>0913</td>
<td>Start drilling rig, raise mast. Wrap a canvas strap around the piezometer casing stick-up, and attempt to pull out; unsuccessful.</td>
</tr>
<tr>
<td>0913</td>
<td>0917</td>
<td>Cut PVC casing off flush with the ground surface. Rig up with an 8 3/4-in. diameter tricone bit on a subadapter; total length = 4.3 ft, table height = 3.1 ft.</td>
</tr>
</tbody>
</table>
| 0917  | 0955 | Commence drilling up the PVC casing/screen while reaming the wellbore using compressed air only. Drill/ream from 0.0 ft to 54.3 ft BGS. Stop after penetrating asphalt (0.5 ft BGS) to measure trapped gases, lower explosive limit (LEL) reading: <1% (5.6 ppm), background = 4.8 ppm. Breathing zone analysis (BZA) at 4.0 ft BGS = 0.2 ppm (very strong ammonia odor). Cuttings from 0.0 ft to 6.2 ft BGS consist predominantly of light gray (N7) cement fragments, along with medium dark gray (N4) asphalt (which
<table>
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<tr>
<th>DATE</th>
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<tbody>
<tr>
<td>9-22-95</td>
<td></td>
<td><strong>STOP AT 0.5 FT BGS, AND WHITE (N9) PVC FRAGMENTS. LOSE CIRCULATION AT 16.2 FT BGS. CUTTINGS FROM 6.2 FT TO 16.2 FT BGS ARE ALMOST EXCLUSIVELY MEDIUM-GRAINED, &quot;DIRTY&quot; QUARTZ SAND; SAND IS DIRTLIED WITH FRAGMENTS OF BLACKENED SHALE, SLAG, CIDERS, ETC. STILL OBSERVE PVC FRAGMENTS IN THE RETURNS. BZA AT 23.2 FT BGS = 0.0 PPM (SLIGHT, LINGERING AMMONIA ODOR). SLIGHTLY RATTY DRILLING AT 35.5 FT, 42.0 FT, 46.5 FT, AND 48.2 FT BGS, OTHERWISE BIT ESSENTIALLY FREE-FALLS TO 51.2 FT BGS. ENCOUNTER ROCK AT 53.1 FT BGS (BOTTOM OF WELBORE); TOOLS ARE BOUNCING. BZA AT 53.5 FT BGS = 0.4 PPM (LINGERING AMMONIA ODOR). NO CIRCULATION SINCE 16.2 FT BGS.</strong></td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
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</tr>
<tr>
<td>0955</td>
<td>1036</td>
<td><strong>AT 54.3 FT BGS. CLEAN OUT BOREHOLE BRIEFLY; LOOSE, &quot;DIRTY&quot; SAND MAY BE SLUGHING IN AND MAY STICK THE TOOLS. TRIP OUT TOOLS. TAG BOTTOM OF BOREHOLE AT 16.0 FT BGS (38.3 FT OF FILLS); WILL NOT TRY TO CLEAN BOREHOLE ANYMORE TO AVOID GETTING TOOLS STUCK. REPORT STATUS TO K. JAGO (HSEA) WHO DIRECTS TO GROUT BOREHOLE AS IS.</strong></td>
</tr>
<tr>
<td>1036</td>
<td>1054</td>
<td><strong>LOWER MAST AND MOVE DRILL RIG OFF SITE. CALCULATE A BOREHOLE VOLUME TO THE GROUND SURFACE OF 6.7 CUBIC FT, EQUIVALENT TO 5.7 SACKS OF TYPE I CEMENT.</strong></td>
</tr>
<tr>
<td>1054</td>
<td>1130</td>
<td><strong>MIX AND POUR 9 SACKS (10.6 CUBIC FT) OF NEAT, TYPE I PORTLAND CEMENT (WITH AN AVERAGE GROUT WT OF 13.7 LBS/GAL) DIRECTLY INTO THE BOREHOLE. LIQUID CEMENT FILLS THE BOREHOLE TO THE GROUND SURFACE.</strong></td>
</tr>
<tr>
<td>1130</td>
<td>1147</td>
<td><strong>CLEAN UP, DEMOBILIZE DRILL RIG AND OTHER DRILLING EQUIPMENT. DEPART SITE.</strong></td>
</tr>
<tr>
<td>1330</td>
<td>1331</td>
<td><strong>RETURN TO B-1 SITE. CEMENT PLUG REMAINS AT THE GROUND SURFACE AND HAS BEGUN TO SET UP.</strong></td>
</tr>
</tbody>
</table>

P&A of Piezometer B-1 is complete.
### WELL PLUGGING AND ABANDONMENT
#### ACTIVITY/PROGRESS REPORT

**LOCATION:** Urea Pile (East Chestnut Ridge)  
**DATE:** START: 9-21-95  
**FINISH:** 9-22-95

**DRILLER:** H. Hall - Highland Drilling Co.  
**HELPERS:** R. Phillips/G. Shilling/J. Gallaher

**DRILL:** Ingersoll-Rand T4W  
**METHOD:** C  
**LOGGED BY:** Timothy Coffey - SAIC

<table>
<thead>
<tr>
<th>DATE</th>
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<tbody>
<tr>
<td>9-21-95</td>
<td>0954</td>
<td>Arrive at piezometer B-3 site. Piezometer consists of 2-in. inside diameter (ID) PVC casing. Casing stick-up is 1.9 ft. The piezometer has been grouted to the surface, and the original borehole appears to have been 8-in. in diameter. Uncap the piezometer; organic vapors in casing headspace = 0.0 ppm. Tag bottom of the well at 35.8 ft below ground surface (BGS). No water level, piezometer is dry. Position drill rig over the well. Background radiological scan of location: beta/gamma = 40-50 cpm (no alpha reading, ground is wet).</td>
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<tr>
<td></td>
<td>1015</td>
<td></td>
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<tr>
<td>1015</td>
<td>1021</td>
<td>Raise the mast. Cut off casing stick-up flush with the ground surface. Rig up with an 8 3/4-in. diameter tricone bit on a subadapter; total length = 4.3 ft, table height = 2.8 ft.</td>
</tr>
<tr>
<td>1021</td>
<td>1110</td>
<td>Commence drilling up the casing/reaming the wellbore using compressed air only. Drill/ream from 0.0 ft to 37.5 ft BGS. Cutting from 0.0 ft to 0.5 ft BGS are dark gray (N3) asphalt aggregate; greenish-black (5GY 2/1) to brownish-black (5YR 2/1) cement fragments; white (N9) PVC fragments; and wood. Interrupt drilling after passing through asphalt to monitor borehole; lower explosive level (LEL) reading: &lt;1% (6.0 ppm). Breathing Zone Analysis (BZA) at 3.0 ft BGS = 0.1 ppm. Dust abates at 5.5 ft BGS, suspect bentonite annular seal. Cutting from 0.5 ft to 5.5 ft are a continuation of the cement and PVC fragments of above. Bentonite (dark greenish-gray: 5GY 4/1) continues to 6.5 ft BGS when sand (filter pack) is observed in the returns. BZA at 10.5 ft</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>9-21-95</td>
<td></td>
<td><strong>Activity 1</strong>&lt;br&gt;BGS = 0.0 ppm. Slowly losing circulation, completely lost by 16.0 ft BGS. Cuttings from 6.5 ft to 16.0 ft consist predominantly of medium-grained quartz sand, asphalt fragments, slag and cinder fragments, and black-stained shale fragments (trash).&lt;br&gt;BZA at 33.5 ft BGS = 0.0 ppm. Hard drilling at 33.0 ft BGS, tools bouncing. Circulation restored fully at 35.5 ft BGS. Observe a rotten egg odor at 36.0 ft BGS; BZA = 0.2 ppm. Cuttings from 35.5 ft to 37.5 ft continue to be sand and trash from above, along with light brown (5YR 5/6) moist clay. Radiological scan of the cuttings read: alpha = 0 cpm, beta/gamma = 40 cpm for the entire interval.</td>
</tr>
<tr>
<td>1110</td>
<td>1127</td>
<td>At 37.5 ft BGS. Clean out borehole. Trip out tools. Tag bottom of borehole at 35.2 ft BGS (2.3 ft of fill). Rig down, lower mast. Calculate a borehole volume to the ground surface (plan to grout to ground surface because piezometer penetrated asphalt road apron) of 14.8 cubic ft, equivalent to 12.5 sacks of Type I cement.</td>
</tr>
<tr>
<td>1127</td>
<td>1230</td>
<td>Move drill rig off location. Break for lunch.</td>
</tr>
<tr>
<td>1230</td>
<td>1314</td>
<td>Run 1.5-in. outside diameter (OD) PVC tremie pipe into borehole to 29.0 ft BGS. Mix and pump-tremie (using grout plant) 15 sacks (17.7 cubic ft) of neat, Type I Portland cement (grout weight of 14.8 lbs/gal). Liquid cement fills the borehole to 9.5 ft BGS.</td>
</tr>
<tr>
<td>1314</td>
<td>1349</td>
<td>Pull out tremie pipe. Clean up. Secure site and depart.</td>
</tr>
<tr>
<td>9-22-95</td>
<td>0845</td>
<td>0857</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>9-22-95</td>
<td>0857</td>
<td>Mix and pour 6 sacks (7.1 cubic ft) of neat, Type I Portland cement (average grout weight of 14.7 lbs/gal.) directly into borehole.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td>Liquid grout fills the borehole to the ground surface. Clean up and depart.</td>
</tr>
<tr>
<td>1330</td>
<td>1331</td>
<td>Return to B-3 site to check on grout. Cement remains at the ground surface and has begun to set up.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P&amp;A of piezometer B-3 is complete.</td>
</tr>
</tbody>
</table>
**LOCATION:** Oil Landfarm  
**DRILLER:** H. Hall - Highland Drilling Co.  
**HELPERS:** J. Gallaher/J. Monger - Highland Drilling Co.  
**DRILL:** Ingersoll-Rand XL-750

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
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<tbody>
<tr>
<td>9-28-95</td>
<td>0857</td>
<td>0905</td>
</tr>
<tr>
<td>0905</td>
<td>0918</td>
<td>Uncap well, measure organic vapors in well headspace: 0.0 ppm (background = 0.0 ppm); lower explosive limit (LEL) reading: &lt;1% (5.9 ppm). Measure water level at 13.1 ft below ground surface (BGS). Cut off 1.6 ft of the well casing stick-up. Extract the bailer from the well. Tag bottom (solid) at 59.8 ft BGS. Note: the Subsurface Data Base (Y/TS-881/R3) reports the total depth of GW-002 to be 60.0 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 70 cpm.</td>
</tr>
<tr>
<td>0918</td>
<td>0937</td>
<td>Dig around the wellhead, break up the pad, and remove the pieces. The steel conductor casing extends into approximately 6-in. OD PVC surface casing at approximately 2 ft BGS. Chip the annular cement out of the conductor casing and burn 2 lifting holes in it.</td>
</tr>
<tr>
<td>0937</td>
<td>1020</td>
<td>Start the drill rig and raise the mast. Thread clevis into drillhead, attach chain to casing, and pull out conductor casing along with some well casing. Extract 3.1 ft of 5 1/2-in. OD steel conductor casing (plus 1.9 ft removed earlier, making a total of 5.0 ft of...</td>
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<tr>
<td>9-28-95</td>
<td></td>
<td>conductor casing: 15.7 ft of 6 5/8-in. OD PVC surface casing (which had broken); and 15.8 ft of 2 3/8-in. OD stainless steel well casing (appears to have broken off at a connection).</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td>Rig up with washover pipe; length = 14.9 ft (16.7 ft including subadapter), cutting shoe dimensions: 5-in inside diameter (ID), 6 1/2-in OD, table height = 2.6 ft. Run into borehole. Add a second section of washover pipe.</td>
</tr>
<tr>
<td>1020</td>
<td>1044</td>
<td>Connection made, commence over wash using compressed air only. Over wash casing from 15.9 ft to 38.8 ft BGS. Encounter water at 18.5 ft BGS. LEL reading at 22.5 ft BGS &lt;1% (4.9 ppm). Additional moisture at 23.8 ft BGS. Hard drilling at 26.0 ft BGS. Cuttings from 15.9 ft to 26.0 ft BGS consist predominantly of white (N9) to very light gray (N8) cement fragments (high cal-seal content); white (N9) PVC shavings; light olive brown (5YR 5/6) to light brown (5YR 5/6), thinly laminated, weathered shale; and dark yellowish-brown (10YR 4/2), moist clay. Breathing Zone Analysis (BZA) at 28.5 ft BGS = 0.0 ppm. LEL reading at 32.8 ft BGS &lt;1% (7.4 ppm). Fresh bedrock at 35.5 ft BGS. Cuttings from 26.0 ft to 35.5 BGS are moderate yellowish-brown (10YR 5/4) to light olive gray (5Y 5/2), thinly laminated, weathered shale; white (N9), very light gray (N8), and medium gray (N5) cement; and PVC fragments. Additional moisture at 36.8 ft BGS. BZA at 37.3 ft BGS = 0.0 ppm. Cuttings from 35.5 ft to 38.8 ft BGS are grayish-red purple (5RP 4/2) and dark greenish-gray (5G 4/1), thinly laminated shale; and black (N1) to olive black (5Y 2/1), massive micrite. Only minor PVC and cement observed from this interval.</td>
</tr>
<tr>
<td>1044</td>
<td>1121</td>
<td>At 38.8 ft BGS. Clean out borehole. Break subadapter loose from washover pipe.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>9-28-95 (cont.)</td>
<td>1132</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1214</td>
<td></td>
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<td></td>
<td>1214</td>
<td>Continue over wash using compressed air only. Over wash casing/screen from 38.8 ft to 62.2 ft BGS. Borehole had accumulated significant water during the lunch break; it is cleaning up nicely. BZA at 43.3 ft BGS = 0.0 ppm. Tools seem to free-fall: 46.3 ft to 48.0 ft BGS; very hard drilling at 48.0 ft BGS. Cuttings from 38.8 ft to 48.0 ft BGS continue to be the shale, cement, and PVC of above, along with medium-grained quartz sand (filter pack). Drilling rate appears to increase at 50.8 ft BGS. Begin to see water issuing from both the inside and outside of the well casing of GW-001 (9 ft to the west) with the bit at 52.5 ft BGS. BZA at 54.5 ft BGS = 0.0 ppm. Bottom of wellbore at 60.5 ft BGS. Cuttings from 48.0 ft to 62.2 ft BGS are the same as above with the addition of stainless steel screen wires.</td>
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<tr>
<td></td>
<td>1338</td>
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<tr>
<td></td>
<td>1532</td>
<td>At 62.2 ft BGS. Clean out the borehole. Trip washover pipe out of the hole. The well casing/screen is jammed up inside the washover pipe; unknown amount recovered (assume all of it). Tag bottom of borehole at 53.0 ft BGS (9.2 ft of fill).</td>
</tr>
<tr>
<td>9-29-95</td>
<td>0826</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0922</td>
<td>Arrive at GW-002 site. Crew arrives and conducts pre-work equipment inspections.</td>
</tr>
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<td>0922</td>
<td></td>
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<tr>
<td></td>
<td>0930</td>
<td>Rig up with an 8 3/4-in. diameter tricone roller bit on a subadapter; total length = 4.3 ft, table height = 2.6 ft.</td>
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<td>DATE</td>
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</tr>
<tr>
<td>9-29-95</td>
<td>0930</td>
<td>Commence reaming using compressed air only. Ream borehole from 0.0 ft to 62.2 ft BGS. BZA at 4.3 ft BGS = 0.0 ppm. Top of weathered rock at 5.0 ft BGS.</td>
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<tr>
<td>(cont.)</td>
<td></td>
<td>Cuttings from 0.0 ft to 5.0 ft BGS are moderate yellowish-brown (10YR 5/4) to dark yellowish-brown (10YR 4/2), moist silty clay. BZA at 12.7 ft and 18.5 ft BGS both read 0.0 ppm. LEL reading at 24.3 ft BGS &lt;1% (4.1 ppm). BZA at 34.7 ft BGS = 0.0 ppm. Top of fresh rock at 35.5 ft BGS. Cuttings from 5.0 ft to 35.5 ft BGS consist of blackish-red (5R 2/2) and pale olive (10Y 6/2), thinly laminated, weathered shale; plus minor PVC fragments and very light gray (N8) cement fragments. BZA at 44.7 ft BGS = 0.0 ppm. Very ratty drilling; lots of chatter from 47.3 ft to 54.7 ft BGS. BZA at 56.0 ft BGS = 0.0 ppm. Ratty drilling 59.2 ft to 62.2 ft BGS. Cuttings from 35.5 ft to 62.2 ft BGS consist of medium dark gray (N4) to dark gray (N3), thinly laminated shale; olive black (5Y 2/1), massive micrite; and PVC and cement (which disappear toward end of interval). Beta/gamma scan of cuttings range from 50 to 60 cpm for entire interval.</td>
</tr>
<tr>
<td>1028</td>
<td>1028</td>
<td>At 62.2 ft BGS. Clean out borehole. Pull bit 15 ft off bottom.</td>
</tr>
<tr>
<td>1034</td>
<td>1102</td>
<td>Shut off drill rig, wait for water to accumulate in the borehole to aid cleaning.</td>
</tr>
<tr>
<td>1102</td>
<td>1108</td>
<td>Drill rig on; clean out borehole.</td>
</tr>
<tr>
<td>1108</td>
<td>1134</td>
<td>Drill rig off; wait for water to accumulate in borehole to aid cleaning.</td>
</tr>
<tr>
<td>1134</td>
<td>1204</td>
<td>Drill rig on; clean out borehole. Trip out tools. Tag bottom of borehole at 61.6 ft BGS (0.6 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 24.1 cubic ft, equivalent to 20.4 sacks of Type I cement. Secure rods in carousel and lower mast.</td>
</tr>
<tr>
<td>DATE</td>
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<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>9-29-95</td>
<td>1204</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1244</td>
<td></td>
</tr>
<tr>
<td>(cont.)</td>
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<td></td>
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<tr>
<td></td>
<td>1244</td>
<td>Move drill rig off location. Run 1.5-in. OD PVC tremie pipe into borehole to 60.0 ft BGS.</td>
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<tr>
<td></td>
<td>1255</td>
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<tr>
<td></td>
<td>1255</td>
<td>Mix and pump-tremie (using grout plant) 25 sacks (29.5 cubic ft) of neat, Type I Portland cement (grout wt = 14.7 lbs/gal) into the borehole. Circulate water.</td>
</tr>
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<td></td>
<td>1424</td>
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<td>1424</td>
<td>Begin clean up. Attempt to pull out tremie pipe; it is stuck in the hardening cement. Only 1 section of tremie pipe recovered. Secure site and depart.</td>
</tr>
<tr>
<td>10-2-95</td>
<td>0802</td>
<td>At GW-002 site. Tag cement level at 9.0 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 2.1 cubic ft, equivalent to 1.8 sacks of Type I cement. Depart site.</td>
</tr>
<tr>
<td></td>
<td>0810</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0836</td>
<td>Return to GW-002 site. Mix and pour 3 sacks (3.5 cubic ft) of neat, Type I Portland cement (grout wt = 14.2 lbs/gal.) directly into borehole. Liquid cement fills the borehole to the ground surface.</td>
</tr>
<tr>
<td></td>
<td>0904</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0904</td>
<td>Begin cleaning up site. Move drill rig off of the drill site. Part of crew to remain and reclaim site. Note: borehole was capped with clay soil while site was being reclaimed. Estimate cement had settled to approximately 1 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1034</td>
<td>P&amp;A of GW-002 is complete.</td>
</tr>
</tbody>
</table>
**Y-12 PLANT GROUNDWATER PROTECTION PROGRAM**

**WELL NO.** GW-007

## WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT

**LOCATION:** Oil Landfarm  
**DRILLER:** H. Hall - Highland Drilling Co.  
**HELPERS:** R. Phillips/J. Gallaher - Highland Drilling Co.  
**DRILL:** Ingersoll-Rand T4W  
**DATE:** START: 9-19-95  
**FINISH:** 9-21-95  
**METHOD:** A  
**LOGGED BY:** Timothy Coffey - SAIC

### ACTIVITY/COMMENTS

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-19-95</td>
<td>1026-1040</td>
<td>Arrive at GW-007 site. Well has a Well Wizard™ sampling device in it. Pull off cap, measure organic vapors in casing headspace: 0.0 ppm. The top of the well casing is approximately 0.5 ft below ground surface (BGS). Measure water level at 9.0 ft BGS. Radiological scan of location: alpha = 0 cpm, beta/gamma = 40 cpm.</td>
</tr>
<tr>
<td>1040</td>
<td>1053</td>
<td>Cut off the lone protective post. Try removing the Well Wizard™ pump from the well, but it is stuck at the well collar. Cut off tubing, and push pump back down into the well (plan to recover it later when the casing is removed. Unable to make a pre-P&amp;A tag of well bottom. Subsurface Data Base (Y/TS-881/R2) reports the depth of GW-007 to be 16.5 ft.</td>
</tr>
<tr>
<td>1053</td>
<td>1107</td>
<td>Dig around the wellhead exposing the casing. Burn a lifting hole in the casing.</td>
</tr>
<tr>
<td>1107</td>
<td>1133</td>
<td>Move drill rig onto location and position over the well. Set up site. Raise the mast.</td>
</tr>
<tr>
<td>1133</td>
<td>1143</td>
<td>Thread a clevis into the drill head. Attach a chain to the casing, and attempt to pull out; casing does not move. Plan to over wash the casing.</td>
</tr>
<tr>
<td>1143</td>
<td>1302</td>
<td>Break for lunch. Crew also to mobilize washover pipe.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
</tr>
<tr>
<td>-------</td>
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<td>--------------------</td>
</tr>
<tr>
<td>9-19-95</td>
<td>1302</td>
<td>Crew returns. Thread subadapter into washover pipe, and rig up.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td>Total length (including subadapter) = 16.7 ft, table height = 3.4 ft;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Washover bit dimensions: 5-in. inside diameter (ID), 6-1/2-in. outside diameter (OD).</td>
</tr>
<tr>
<td>1314</td>
<td>1316</td>
<td>Commence over wash using compressed air only. Over wash casing from 0.5 ft to 1.0 ft BGS.</td>
</tr>
<tr>
<td>1316</td>
<td>1327</td>
<td>Stop; washover pipe encounters a piece of 6-5/8-in. OD steel conductor casing at 1.0 ft BGS. Will have to use larger washover pipe. Oversight departs, crew to rig up with the larger washover pipe.</td>
</tr>
<tr>
<td>9-20-95</td>
<td>0849</td>
<td>Arrive at GW-007 site. Crew has rigged up with 8-in. ID, 9 1/4-in. OD washover pipe; total length (including subadapter) = 25.5 ft, table height remains at 3.4 ft. Crew conducts pre-work equipment inspections.</td>
</tr>
<tr>
<td></td>
<td>0859</td>
<td>Commence over wash using compressed air only. Over wash casing from 1.0 ft to 9.3 ft BGS. Breathing zone analysis (BZA) at 2.1 ft BGS = 0.0 ppm. Cuttings from 1.0 ft to 3.5 ft BGS consist of moderate brown (5YR 4/4) to moderate reddish-brown (10R 4/6), moist clay with pale yellowish-orange (10YR 8/6) chert fragments. BZA monitoring from 7.5 to 9.3 ft BGS detects organic vapors in concentrations of 1 ppm to 28 ppm, and consistently above 10 ppm. Had encountered a small amount of moisture at 8.0 ft BGS. Cuttings from 3.5 ft to 8.0 ft consist generally of dark yellowish-orange (10YR 6/6), dry clay with very light gray (N8) cement fragments. Below 8.0 ft (and to 9.3 ft BGS) the cuttings are moderate brown (5YR 3/4), moist clay.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>9-20-95</td>
<td>0920</td>
<td>Shut off drill rig. Clear work area. Notify W. Thedford (HSEA), who directs to notify K. Jago. Unable to reach K. Jago by phone. Page, waiting for response. Cuttings on ground surface read 4 ppm; reading inside borehole is up to 200 ppm.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>0952</td>
<td>Contact W. Thedford again who instructs crew to trip out washover pipe, and attempt to pull out casing if breathing zone vapors have dissipated. There is to be no more intrusive work until K. Jago has been informed of the situation. BZA = 0.0 ppm.</td>
</tr>
<tr>
<td></td>
<td>0958</td>
<td>Trip out washover pipe and rig down. OVA reading inside borehole is still at 200 ppm.</td>
</tr>
<tr>
<td></td>
<td>1009</td>
<td>Attach a chain to the well casing and easily pull out the well assembly. Extract 4.1 ft of 6 5/8-in. OD steel conductor casing attached to 19.6 ft of a slightly twisted stainless steel well assembly (which includes a 2.3-ft section of screen and a 2.2-ft silt trap.</td>
</tr>
<tr>
<td></td>
<td>1015</td>
<td>W. Thedford on site. Crew to be on standby until a decision can be made regarding further P&amp;A of the well. Tag bottom of borehole at 9.3 ft BGS. The hole left by the extracted well assembly has collapsed/filled in. OVA reading inside borehole is now at 6 ppm. Beta/gamma scan of extracted well assembly = 40-50 cpm.</td>
</tr>
<tr>
<td></td>
<td>1212</td>
<td>Break for lunch. During lunch HSEA directed to grout the borehole as is. Calculate a borehole volume to 4.0 ft BGS of 2.5 cubic ft, equivalent to 2.1 sacks of Type I cement.</td>
</tr>
<tr>
<td></td>
<td>1212</td>
<td>Mix and pour 4 sacks (4.7 cubic ft) of neat, Type I Portland cement (with an average grout weight of 14.5 lbs/gal.) directly into the borehole. Liquid cement fills the borehole to approximately 1 ft BGS.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>9-20-95</td>
<td>1245</td>
<td>Clean up. Demobilize drill rig. Secure site and depart.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-21-95</td>
<td>0908</td>
<td>At GW-007 site. Tag cement level at 2.4 ft BGS. Cap remaining borehole with clay soil/cuttings.</td>
</tr>
<tr>
<td></td>
<td>0918</td>
<td></td>
</tr>
</tbody>
</table>

P&A of well GW-007 is complete.
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

#### WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT

<table>
<thead>
<tr>
<th>DATE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>6-22-95</td>
<td>0912</td>
<td>Arrive at GW-295 site. Crew on site; have removed the concrete pad and cut off the well casing stick-up. New casing stick-up = 0.6 ft (stick-up of surface casing = 0.4 ft). Measure water level at 140.7 ft below ground surface (BGS). Tag bottom of well (solid) at 146.7 ft BGS. Note: the Subsurface Data Base (Y/TS-881/R3) reports the TD of well GW-295 to be 146.0 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 40 cpm.</td>
</tr>
<tr>
<td>6-22-95</td>
<td>0925</td>
<td></td>
</tr>
<tr>
<td>0925</td>
<td>1030</td>
<td>Move drill rig onto location, and position over the well. Set up the site. Start drill rig. Raise the mast.</td>
</tr>
<tr>
<td>1030</td>
<td>1047</td>
<td>Rig up with the leading section of washover pipe; total length (including subadapter) = 24.0 ft, table height = 3.7 ft. Cutting shoe dimensions: 5-in. inside diameter (ID), 6 1/2-in. outside diameter (OD).</td>
</tr>
<tr>
<td>1047</td>
<td>1120</td>
<td>Commence over wash of the well casing using compressed air only. Over wash the casing from 0.0 ft to 16.0 ft BGS. Cuttings from 0.0 ft to 0.5 ft BGS are very light gray (N8) and medium gray (N5) concrete (and aggregate) fragments. Cuttings from 0.5 ft to 1.5 ft BGS are fragments of limestone gravel that had been used to back-fill the casing annulus: brownish-black (5YR 2/1), massive pelletal micrite. Breathing zone analysis (BZA) at 2.8 ft BGS = 0.1 ppm. Lower explosive limit (LEL) reading at 7.3 ft BGS &lt;1% (7.4 ppm). BZA at 15.3 ft BGS = 0.0 ppm. Cuttings from 1.5 ft to</td>
</tr>
</tbody>
</table>
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-22-95 (cont.)</td>
<td>16.0 ft BGS consist predominantly of pale yellowish-brown (10YR 6/2), soft cement (may contain high bentonite content); plus rare metal slivers.</td>
<td></td>
</tr>
<tr>
<td><strong>1120</strong></td>
<td><strong>1200</strong></td>
<td>Break for lunch.</td>
</tr>
<tr>
<td><strong>1200</strong></td>
<td><strong>1348</strong></td>
<td>Continue over wash of well casing. Overwash casing from 16.0 ft to 60.7 ft BGS. BZA at 25.5 ft BGS = 0.0 ppm. LEL reading at 32.4 ft BGS &lt;1% (9.0 ppm). BZA at 35.5 ft, 46.0 ft, and 55.5 ft BGS all read 0.0 ppm. Observe numerous ratty drilling spots and locations where washover pipe vibrates in this interval. Cuttings from 16.0 ft to 60.7 ft BGS are a continuation of the high-bentonite cement from 1.5 ft to 16.0 ft BGS. Beta/gamma scan of cuttings measure 40 cpm for the entire interval.</td>
</tr>
<tr>
<td><strong>1348</strong></td>
<td><strong>1405</strong></td>
<td>At 60.7 ft BGS, out of washover pipe. Break subadapter loose from washover pipe. Shut off drill rig; wait for more washover pipe to be brought to site.</td>
</tr>
<tr>
<td><strong>1405</strong></td>
<td><strong>1422</strong></td>
<td>Additional washover pipe on site. Add another section to the string.</td>
</tr>
<tr>
<td><strong>1422</strong></td>
<td><strong>1529</strong></td>
<td>Connection made, continue over wash of well casing. Overwash casing from 60.7 ft to 101.1 ft BGS. BZA at 65.9 ft, 76.1 ft, 86.2 ft, and 96.0 ft BGS read 0.0 ppm, 0.4 ppm, 0.0 ppm, and 0.2 ppm, respectively. Cuttings from 60.7 ft to 101.1 ft BGS are a continuation of above, with the amount of metal shards increasing with depth. Beta/gamma scan of cuttings is 40 cpm for this interval.</td>
</tr>
<tr>
<td><strong>1529</strong></td>
<td><strong>1543</strong></td>
<td>At 101.1 ft BGS. Clean out borehole. Secure washover pipe at borehole collar. Depart site.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>START</td>
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<tr>
<td>6-23-95</td>
<td>0830</td>
<td>0853</td>
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<td>0853</td>
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<td>1213</td>
<td>1302</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>6-23-95</td>
<td>1302</td>
<td>Break subadapter loose from washerover pipe. Tag top of casing inside washerover pipe at approximately 83 ft BGS. Tag the bottom of the casing at 125.0 ft BGS (assume that casing/screen are wedged in washerover pipe).</td>
</tr>
<tr>
<td></td>
<td>1318</td>
<td>Begin tripping washerover pipe out of the borehole. Extract another 10.0 ft of 4.5-in OD stainless steel casing. Secure site and depart.</td>
</tr>
<tr>
<td>6-26-95</td>
<td>0850</td>
<td>Arrive at GW-295 site. Crew conducts pre-work equipment inspections. Continue tripping washerover pipe out of the borehole. Extract another 40.4 ft of 4.5-in OD stainless steel casing and screen from the borehole. A total of 146.8 ft of 4.5-in OD stainless steel well components removed from well GW-295.</td>
</tr>
<tr>
<td></td>
<td>1155</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1256</td>
<td>Waiting on fuel. Fuel drill rig.</td>
</tr>
<tr>
<td></td>
<td>1306</td>
<td>Rig up with a 9 7/8-in. diameter tricone bit on a stabilizer; total length = 20.3 ft, table height = 3.9 ft. Shut off rig.</td>
</tr>
<tr>
<td>6-27-95</td>
<td>0843</td>
<td>Arrive at GW-295 site. Crew conducts pre-work equipment inspections. Trip back into borehole.</td>
</tr>
<tr>
<td></td>
<td>0901</td>
<td>Commence reaming the wellbore using compressed air only. Ream wellbore from 0.0 ft to 116.4 ft BGS. BZA at 6.0 ft, 31.4 ft, 51.4 ft, 81.4 ft, and 106.4 ft BGS all read 0.0 ppm. Cuttings from 0.0 ft to 116.4 ft BGS are predominantly pale yellowish-brown (10YR 6/2) cement, with minor metal shards.</td>
</tr>
<tr>
<td></td>
<td>1549</td>
<td>At 116.4 ft BGS. Clean out borehole. Pull bit up to last connection. Secure site and depart.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
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</tr>
<tr>
<td>6-27-95</td>
<td>0901</td>
<td>Commence reaming wellbore using compressed air only. Ream wellbore from 116.4 ft to 148.4 ft BGS. BZA at 121.4 ft BGS = 0.1 ppm. Dust abates and drilling rate increases at 124.4 ft BGS (suspect bentonite seal). Cuttings from 116.4 ft to 124.4 ft BGS are a continuation of above. Cuttings from 124.4 ft to 130.4 ft BGS are yellowish-gray (5Y 7/2) and light olive gray (5Y 5/2) bentonite. BZA at 132.0 ft BGS = 0.0 ppm. Bottom of wellbore at 146.0 ft BGS. BZA at 143.4 ft BGS = 0.0 ppm. Cuttings from 130.4 ft to 148.4 ft BGS consist of medium light gray (N6) to grayish-black (N2), massive dolostone and fine- to medium-grained quartz sand (filter pack). Beta/gamma scan of cuttings range from 40 to 50 cpm for the entire interval.</td>
</tr>
<tr>
<td>0929</td>
<td>0950</td>
<td>At 148.4 ft BGS. Cleaning borehole (spotty circulation). Begin tripping out of the borehole, having to rotate rods because of debris.</td>
</tr>
<tr>
<td>0950</td>
<td>1135</td>
<td>Main hydraulic hose bursts behind control panel. Spill control measures taken: plastic sheeting spread on ground around borehole collar, oil absorbant pads on pooling hydraulic oil, majority of oil caught in buckets. Remove damaged hydraulic hose. Supervisor departs to have a new hose made. Crew shovelling contaminated soil into a lined open-top drum.</td>
</tr>
<tr>
<td>1135</td>
<td>1215</td>
<td>Supervisor returns with new hydraulic hose. Break for lunch.</td>
</tr>
<tr>
<td>1215</td>
<td>1342</td>
<td>Spill control completed. Replace hydraulic hose. Fill hydraulic tank, adjust needle pressure valve, and reassemble control panel.</td>
</tr>
<tr>
<td>1342</td>
<td>1421</td>
<td>Add rods to string, trip back to bottom of borehole. Add water, clean out borehole.</td>
</tr>
</tbody>
</table>
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

#### WELL PLUGGING AND ABANDONMENT

#### ACTIVITY/PROGRESS REPORT - continued

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-27-95</td>
<td>1421</td>
<td>Trip out tools. Tag bottom of borehole at 140.3 ft BGS (8.1 ft of fill). Calculate a borehole volume to 100.0 ft BGS (assumed depth of surface casing) of 21.4 cubic ft, equivalent to 18.1 sacks of Type I cement.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1459</td>
<td>Run 1.5-in. OD PVC tremie pipe into borehole to 136.0 ft BGS. Secure site, and depart.</td>
</tr>
<tr>
<td>6-28-95</td>
<td>0832</td>
<td>Arrive at GW-295 site. Mix and pump-tremie 33 sacks (38.9 cubic ft) of neat, Type I Portland cement (average grout weight of 14.2 lbs/gallon) into the borehole. Tag liquid cement level at approximately 115 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1010</td>
<td>Pull out tremie pipe, and clean up. Load small washover pipe and stainless steel well materials onto float to remove from site. Secure site, and depart.</td>
</tr>
<tr>
<td>6-29-95</td>
<td>0827</td>
<td>Arrive at GW-295 site. Tag cement level at 112.1 ft BGS. Crew conducts pre-work equipment inspections. Have already rigged up the leading section of big washover pipe; total length = 26.2 ft (includes subadapter), table height = 3.5 ft. Cutting shoe dimensions: 12-in. ID, 13 3/4-in. OD.</td>
</tr>
<tr>
<td></td>
<td>0841</td>
<td>Commence over wash of surface casing using compressed air only. Over wash casing from 0.0 ft to 19.9 ft BGS. BZA at 2.7 ft BGS = 0.1 ppm. Cuttings from 0.0 ft to 6.5 ft BGS consist predominantly of pale yellowish-brown (10YR 6/2) cement fragments; dark gray (N3) limestone gravel; and light brown 5YR 5/6 to moderate brown (5YR 4/4), silty clay. BZA at 9.7 ft BGS = 0.0 ppm. LEL reading at 16.5 ft BGS &lt;1% (12.5 ppm).</td>
</tr>
<tr>
<td></td>
<td>1130</td>
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</tr>
</tbody>
</table>
### ACTIVITY/COMMENTS

#### 6-29-95 (cont.)

- **(10R 4/6)** clay with pale yellowish-orange (10YR 8/6) chert fragments. Beta/gamma scan of cuttings measure 40 cpm for the interval.

#### 1130 - 1213

- Break for lunch.

#### 1213 - 1256

- Break subadapter loose from washover pipe. Add another section of washover pipe to string.

#### 1256 - 1358

- Connection made, continue over wash of surface casing using compressed air only. Over wash casing from 19.9 ft to 27.0 ft BGS. BZA at 23.0 ft BGS = 0.0 ppm. Cuttings from 19.9 ft to 27.0 ft BGS are a continuation of the 6.5-ft to 19.9-ft interval. Beta/gamma scan of cuttings measure 50 cpm for the interval.

#### 1358 - 1419

- At 27.0 ft BGS. Clean out borehole. Secure site and depart.

#### 6-30-95

- **0831 - 1004** Arrive at GW-295 site. Crew conducts pre-work equipment inspections. Crew performs minor maintenance on the rig.

- **1004 - 1133** Commence over wash of the surface casing using compressed air and water. Over wash casing from 27.0 ft to 37.0 ft BGS. BZA at 32.5 ft BGS = 0.0 ppm. Cuttings from 27.0 ft to 37.0 ft BGS are a continuation of above.

- **1133 - 1235** Break for lunch.

- **1235 - 1455** Continue over wash of surface casing. Over wash casing from 37.0 ft to 39.7 ft BGS. BZA at 37.7 ft BGS = 0.0 ppm. Beta/gamma scan of the cuttings range from 40 to 50 cpm for the entire interval.
<table>
<thead>
<tr>
<th>DATE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>6-30-95</td>
<td>1455</td>
<td>At 39.7 ft BGS. Clean out borehole. Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td>Technical oversight by V. R. Harness - SAIC. Arrive at GW-295 site. Start drilling.</td>
</tr>
<tr>
<td>7-11-95</td>
<td>0950</td>
<td>Rotate tools, clean out borehole again.</td>
</tr>
<tr>
<td></td>
<td>1029</td>
<td>Begin breaking out topmost section of washover pipe.</td>
</tr>
<tr>
<td></td>
<td>1129</td>
<td>Unable to break connection, break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1229</td>
<td>Resume work. Break connection, and trip out washover pipe.</td>
</tr>
<tr>
<td></td>
<td>1229</td>
<td>Remove washover shoe (to be taken in for reconditioning). Secure site, and depart.</td>
</tr>
<tr>
<td></td>
<td>1547</td>
<td>Thread reconditioned cutting shoe onto washover pipe, and trip tools back into borehole.</td>
</tr>
<tr>
<td>7-13-95</td>
<td>0833</td>
<td>Commence overwash of surface casing. Over wash casing from 39.7 ft to 47.4 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>0953</td>
<td>BZA at 40.2 ft BGS = 0.0 ppm. LEL readings at 42.4 ft BGS &lt;1%. BZA at 44.9 ft BGS = 0.0 ppm. Cuttings from 39.7 ft to 47.4 ft BGS continue to be the cement and clay with chert as above.</td>
</tr>
<tr>
<td></td>
<td>1129</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1210</td>
<td>Continue over wash of surface casing. Over wash casing from 47.4 ft to 53.0 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1503</td>
<td>BZA at 52.0 ft BGS = 0.0 ppm. BZA at 53.0 ft BGS = 0.0 ppm. Cuttings continue as above.</td>
</tr>
<tr>
<td></td>
<td>1540</td>
<td>Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
</tr>
<tr>
<td>---------</td>
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<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>7-14-95</td>
<td>0843</td>
<td>Arrive at GW-295 site. Crew performs light maintenance on the drill rig. Will try over wash with compressed air only to clean the borehole better.</td>
</tr>
<tr>
<td></td>
<td>0900</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0900</td>
<td>Commence over wash of surface casing. Over wash casing from 53.0 ft to 60.0 ft BGS. BZA and LEL reading at 56.0 ft BGS = 0.0 ppm and &lt;1%, respectively.</td>
</tr>
<tr>
<td></td>
<td>1040</td>
<td>BZA and LEL reading at 59.5 ft BGS = 0.0 ppm and &lt;1%, respectively. Cuttings from 53.0 ft to 60.0 ft BGS consist of light gray (N7) to medium light gray (N6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cement fragments, brownish-gray (5YR 4/1) to medium gray (N5) dolostone (occasionally oolitic), banded chert, and metal slivers.</td>
</tr>
<tr>
<td></td>
<td>1040</td>
<td>At 60.0 ft BGS. Report slow advance and borehole cleaning problems to K. Jago (HSEA) who approves use of alcohol-based drilling soap to lubricate the tools and raise the cutting, and an excavation of a pit to catch the effluent. Crew excavates a cuttings pit.</td>
</tr>
<tr>
<td></td>
<td>1140</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1215</td>
<td>Technical oversight by S.L. Abston - SAIC. Break subadapter loose from washover pipe. Add another section of washover pipe to string.</td>
</tr>
<tr>
<td></td>
<td>1313</td>
<td>Connection made, continue over wash of surface casing. Over wash casing from 60.0 ft to 65.0 ft BGS. Cuttings are a continuation of the 53 ft to 60 ft interval.</td>
</tr>
<tr>
<td></td>
<td>1431</td>
<td>At 65.0 ft BGS, out of water. Secure site and depart.</td>
</tr>
</tbody>
</table>
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

#### WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued

<table>
<thead>
<tr>
<th>DATE</th>
<th>START</th>
<th>FINISH</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-17-95</td>
<td>0847</td>
<td>0908</td>
<td>Arrive at GW-295 site. Crew conducts pre-work equipment inspections.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0908</td>
<td>1143</td>
<td>Commence over wash of surface casing using compressed air, water, and soap. Over wash casing from 65.0 ft BGS to 73.0 ft BGS. BZA and LEL reading at 67.0 ft BGS = 0.0 ppm and &lt;1% (9.0 ppm), respectively. BZA and LEL reading at 70.0 ft BGS = 0.0 ppm and &lt;1% (9.0 ppm), respectively. Cuttings continue to be same as above, metal fragments appear to increase in this interval.</td>
</tr>
<tr>
<td></td>
<td>1143</td>
<td>1240</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1240</td>
<td>1411</td>
<td>Continue over wash of surface casing. Over wash casing from 73.0 ft BGS to 82.0 ft BGS. Cuttings are the same as above, with abundant chert fragments in this interval.</td>
</tr>
<tr>
<td></td>
<td>1411</td>
<td>1527</td>
<td>At 82.0 ft BGS (end of washover pipe). Break out subadapter, and add another section of washover pipe to string. Secure site and depart.</td>
</tr>
<tr>
<td>7-18-95</td>
<td>0842</td>
<td>0859</td>
<td>Arrive at GW-295 site. Crew conducts pre-work equipment inspections.</td>
</tr>
<tr>
<td></td>
<td>0859</td>
<td>1110</td>
<td>Commence over wash of surface casing using compressed air, water, and &quot;soap.&quot; Over wash the casing from 82.0 ft to 89.0 ft BGS. BZA and LEL reading at 82.5 ft BGS = 0.0 ppm and &lt;1% (9.0 ppm), respectively. BZA and LEL reading at 86.0 ft BGS = 0.0 ppm and &lt;1% (9.0 ppm), respectively. BZA and LEL reading at 89.0 ft BGS = 0.0 ppm and &lt;1% (9.0 ppm), respectively.</td>
</tr>
<tr>
<td></td>
<td>1110</td>
<td>1204</td>
<td>Break for lunch.</td>
</tr>
</tbody>
</table>
**DATE** | **TIME** | **ACTIVITY/COMMENTS**
--- | --- | ---
7-18-95 | 1204 | Continue over wash of surface casing. Over wash casing from 89.0 ft to 99.0 ft BGS. Interrupt over wash briefly to replace an "O" ring gasket in leaking hydraulic connection. BZA and LEL reading at 96.0 ft BGS = 0.0 ppm and <1% (9.0 ppm), respectively. Cuttings continue from above, but chert and dolostone fragments are increasing with depth. Find out from original well log for GW-295 that surface casing extends to 123.0 ft BGS.
(cont.) | 1459 | At 99.0 ft BGS. Break subadapter loose from washerover pipe. Attach a chain to the surface casing, and attempt to pull out; unsuccessful. Secure site and depart.
1459 | 1600 | Technical oversight resumed by T.J. Coffey - SAIC. Commence over wash of surface casing using compressed air, water, and "soap." Overwash casing from 99.0 ft to 101.5 ft BGS. BZA at 99.6 ft BGS = 0.3 ppm. Cuttings as above.
7-19-95 | 0850 | Arrive at GW-295 site. Reconnect subadapter.
0920 | 1012 | Inside of subadapter is rubbing on casing, depth is 101.5 ft BGS. Break subadapter loose from washerover pipe.
1012 | 1100 | Weld a collar onto the surface casing to use a lifting bell to try and pull casing out.
7-19-95 | 1100 | Break for lunch.
1210 | 1238 | Technical oversight resumed by S.L. Abston - SAIC. Thread lifting bell onto surface casing, and attempt to pull out; unsuccessful.
1238 | 1251 | Rig up with a 9 7/8-in. diameter tricone bit on a stabilizer; total length = 20.3 ft, table height remains at 3.5 ft. Trip into casing.
<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-19-95</td>
<td>1353</td>
<td>Drilling through cement from 112.1 ft to 131.0 ft BGS.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1421</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1421</td>
<td>At 131.0 ft BGS. Clean out borehole. Trip out tools.</td>
</tr>
<tr>
<td></td>
<td>1502</td>
<td>Attempt to pull out surface casing; again, unsuccessful. Will need to continue over wash. Secure site and depart.</td>
</tr>
<tr>
<td>7-20-95</td>
<td>0831</td>
<td>Arrive at GW-295 site. Crew conducts pre-work equipment inspections. Crew has brought 2 more sections of washover pipe: 7.2 ft and 10.0 ft in length.</td>
</tr>
<tr>
<td></td>
<td>0954</td>
<td>Rig up with the 7.2-ft section of washover pipe. Having trouble getting new washover pipe to thread onto other washover pipe.</td>
</tr>
<tr>
<td></td>
<td>1024</td>
<td>Commence over wash. Over wash the surface casing from 101.5 ft to 103.5 ft BGS. BZA at 101.6 ft BGS = 0.0 ppm; LEL &lt;1% (9.0 ppm). Cuttings from 101.5 ft to 103.0 ft BGS are predominantly the chert and dolostone of above.</td>
</tr>
<tr>
<td></td>
<td>1145</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td>7-20-95</td>
<td>1230</td>
<td>Resume over wash of surface casing. Over wash casing from 103.0 ft to 104.0 ft BGS. Washover pipe is rubbing on surface casing. BZA at 103.0 ft BGS = 0.0 ppm; LEL &lt;1% (9.0 ppm). Cuttings are a continuation of above.</td>
</tr>
<tr>
<td></td>
<td>1538</td>
<td>Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>7-21-95</td>
<td>0845</td>
<td>Arrive at GW-295 site. Crew on site performing pre-work equipment inspections.</td>
</tr>
</tbody>
</table>
**Activity/Comments**

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7-21-95</strong></td>
<td>0849</td>
<td>Start drill rig and commence over wash of surface casing. Over wash casing from 104.0 ft to 104.2 ft BGS. Plan to trip out to recondition bit.</td>
</tr>
<tr>
<td><strong>cont.</strong></td>
<td>0950</td>
<td>Remove the 7.2-ft section of washover pipe from the string.</td>
</tr>
<tr>
<td></td>
<td>1049</td>
<td>Burn off collar used to try and pull the casing.</td>
</tr>
<tr>
<td></td>
<td>1132</td>
<td>Re-thread the 7.2-ft section of washover pipe onto the string.</td>
</tr>
<tr>
<td></td>
<td>1151</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1220</td>
<td>Continue over wash of surface casing (wanted to see if removal of collar would help in washover advance by reducing rubbing friction; it does not).</td>
</tr>
<tr>
<td></td>
<td>1258</td>
<td>Begin tripping out washover pipe. Remove 2 sections. Depart site.</td>
</tr>
<tr>
<td><strong>7-24-95</strong></td>
<td>0835</td>
<td>Technical oversight resumed by T.J. Coffey (SAIC). Arrive at GW-295 site. Continue tripping washover pipe out of the borehole.</td>
</tr>
<tr>
<td></td>
<td>1152</td>
<td>All of the washover pipe is out of the hole, and the shoe has been unthreaded from the leading section. Break for lunch. Crew takes shoe to shop to be reconditioned. Secure site and depart.</td>
</tr>
<tr>
<td><strong>7-25-95</strong></td>
<td>0840</td>
<td>Arrive at GW-295 site. Crew begins cleaning out the cuttings pit; prepare to weld a collar back onto surface casing.</td>
</tr>
<tr>
<td></td>
<td>0925</td>
<td>Weld collar to surface casing. Thread lifting bell into collar. Attempt to pull surface casing; unsuccessful, used 53,000 lbs hold-back pressure.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>------</td>
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</tr>
<tr>
<td>7-25-95</td>
<td>1032</td>
<td>Rig back up with the lead section of washover pipe.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1044</td>
<td>Shut off drill rig. Waiting for shoe.</td>
</tr>
<tr>
<td></td>
<td>1044</td>
<td>The reconditioned shoe arrives. Thread onto lead section of washover pipe.</td>
</tr>
<tr>
<td></td>
<td>1330</td>
<td>Begin running washover pipe back into borehole.</td>
</tr>
<tr>
<td></td>
<td>1544</td>
<td>Stop with bit at 68.8 ft BGS. Secure site and depart.</td>
</tr>
<tr>
<td>7-26-95</td>
<td>0844</td>
<td>Arrive at GW-295 site. Continue running washover pipe back into borehole.</td>
</tr>
<tr>
<td></td>
<td>1031</td>
<td>Hole is getting tight, will have to be rotating washover pipe from here to bottom.</td>
</tr>
<tr>
<td></td>
<td>1031</td>
<td>Washover pipe to bottom of borehole. Commence over wash of surface casing.</td>
</tr>
<tr>
<td></td>
<td>1145</td>
<td>Over wash casing using compressed air, water, and soap from 104.2 ft to 105.7 ft BGS. Cuttings from 104.2 ft to 105.7 ft consist of pale brown (5YR 5/2) to medium gray (N5) cement fragments, metal slivers, and possibly some dolostone fragments.</td>
</tr>
<tr>
<td></td>
<td>1145</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td>7-26-95</td>
<td>1238</td>
<td>Continue over wash. Over wash surface casing from 105.7 ft to 108.2 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1536</td>
<td>Lost circulation immediately; no cuttings 105.7 ft to 107.5 ft BGS. BZA at 106.3 ft BGS = 0.3 ppm. Circulation restored at 107.5 ft BGS. Cuttings from 107.5 ft to 108.2 ft BGS are the same as above.</td>
</tr>
<tr>
<td></td>
<td>1536</td>
<td>At 108.2 ft BGS. Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>7-27-95</td>
<td>0827</td>
<td>Arrive at GW-295 site. Crew conducts pre-work equipment inspections.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
</tr>
<tr>
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</tr>
<tr>
<td>7-27-95</td>
<td>0912</td>
<td>Break subadapter loose from drill head and washover pipe, and remove. Attempt to pull out surface casing; unsuccessful.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0930</td>
<td>Add the 10.0-ft section of washover pipe to tools.</td>
</tr>
<tr>
<td></td>
<td>0957</td>
<td>Connection made. Commence over wash using compressed air, water, and &quot;soap.&quot; Over wash casing from 108.2 ft to 110.0 ft BGS. Circulation is spotty. BZA at 109.6 ft BGS = 0.0 ppm. Cuts are a continuation of above, but are all very fine grained as if being reground.</td>
</tr>
<tr>
<td></td>
<td>1135</td>
<td>Stop at 110.0 ft BGS. Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1216</td>
<td>Continue over wash.</td>
</tr>
<tr>
<td></td>
<td>1315</td>
<td>Cease over wash; out of water. Waiting for water truck.</td>
</tr>
<tr>
<td></td>
<td>1401</td>
<td>Water truck returns. Continue over wash. Over wash surface casing to 111.2 ft BGS. Circulation is spotty, but improves toward end of the interval. Cuts are a continuation of above.</td>
</tr>
<tr>
<td>7-27-95</td>
<td>1545</td>
<td>Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>7-28-95</td>
<td>0820</td>
<td>Arrive at GW-295 site. Crew conducts pre-work equipment inspections.</td>
</tr>
<tr>
<td></td>
<td>0852</td>
<td>Commence over wash using compressed air, water, and &quot;soap.&quot;</td>
</tr>
<tr>
<td></td>
<td>1025</td>
<td>Over wash surface casing from 111.2 ft to 111.6 ft BGS. Cuts appear to be continuation of above. Too few fragments returned to screen for disposal.</td>
</tr>
</tbody>
</table>

7-28-95 0820 0852 Arrive at GW-295 site. Crew conducts pre-work equipment inspections.

0852 1025 Commence over wash using compressed air, water, and "soap." Over wash surface casing from 111.2 ft to 111.6 ft BGS. Cuts appear to be continuation of above. Too few fragments returned to screen for disposal.
<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-28-95</td>
<td>1025-1108</td>
<td>Cease over wash at 111.6 ft BGS; out of water. Waiting for water truck.</td>
</tr>
<tr>
<td>(cont)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1138-1205</td>
<td>Crew brings an auxiliary air compressor to location; move into position. Will use auxiliary compressor to try and clean borehole better.</td>
</tr>
<tr>
<td></td>
<td>1205-1326</td>
<td>Connect auxiliary compressor to drill rig air system.</td>
</tr>
<tr>
<td></td>
<td>1326-1524</td>
<td>Continue over wash using auxiliary compressor. Auxiliary compressor appears to be cleaning the hole well, but is not improving the advance rate. Shut off auxiliary compressor at 1348 hours. Over wash surface casing from 111.6 ft to 111.9 ft BGS. BZA at 111.8 ft BGS = 0.0 ppm.</td>
</tr>
<tr>
<td></td>
<td>1524-1530</td>
<td>Cease over wash at 111.9 ft BGS. Secure site and depart.</td>
</tr>
<tr>
<td>7-31-95</td>
<td>0820-0920</td>
<td>Arrive at GW-295 site. Discuss options because over wash has become so slow. K. Jago (HSEA) approves using a casing cutter to cut off casing, then continue with P&amp;A. It will take approximately 1 week for cutter to arrive.</td>
</tr>
<tr>
<td></td>
<td>0920-1135</td>
<td>Begin tripping washover pipe out of the borehole.</td>
</tr>
<tr>
<td></td>
<td>1135-1220</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1220-1430</td>
<td>Continue tripping washover pipe out of the borehole.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
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</tr>
<tr>
<td>7-31-95</td>
<td>1430-1458</td>
<td>All of the washover pipe is out of the borehole. The bottom of the shoe has been worn flat. Thread lifting bell onto casing, and attempt to pull out; unsuccessful.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1458-1518</td>
<td></td>
<td>Shut off drill rig. Clean up site. Oversight departs, crew to remain and begin demobilization. P&amp;A to resume when casing cutter is delivered.</td>
</tr>
<tr>
<td>1400-1416</td>
<td></td>
<td>Lower cutting tool into casing to approximately 110 ft BGS.</td>
</tr>
<tr>
<td>1416-1426</td>
<td></td>
<td>Rotate tool/cut the surface casing.</td>
</tr>
<tr>
<td>1426-1458</td>
<td></td>
<td>Remove casing cutter from casing. Rig up; ready to pull casing.</td>
</tr>
<tr>
<td>1458-1526</td>
<td></td>
<td>Pull casing. Extract 18.9 ft of 10-in. ID, 10 3/4-in. OD steel casing. Heavy rain and thunderstorm force crew and oversight to abandon site. Depart.</td>
</tr>
<tr>
<td>0931-1030</td>
<td></td>
<td>Continue pulling casing out of the borehole. Extract 91.5 ft of 10-in. ID, 10 3/4-in. OD steel casing (plus 18.9 ft recovered yesterday for a total of 110.4 ft of casing). Tag bottom of borehole at 109.5 ft BGS (annulus, unable to &quot;find&quot; inside of casing).</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
</tr>
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</tr>
<tr>
<td>9-14-95</td>
<td>1030</td>
<td>Push in a (2.9-ft section of 19 1/4-in. ID, 20-in. OD steel conductor casing. Casing stick-up = 0.7 ft.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1120</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td>Rig up with a 15-in. diameter hole opener on a stabilizer; length to reaming cones = 18.6 ft, total length = 20.1 ft, table height = 3.6 ft. Run into borehole; hole opener easily slides into wallowed out borehole.</td>
</tr>
<tr>
<td></td>
<td>1220</td>
<td>Hole opener meets resistance at 37.0 ft BGS; commence reaming the borehole using compressed air, water, and &quot;soap.&quot; Ream borehole from 37.0 ft to 107.5 ft BGS. Very few cuttings ever made it to the surface, mostly just &quot;soap&quot; foam. Of the few cuttings to make it to the surface, medium light gray (N6) and light brown (5YR 5/6) clay predominate. Ratty drilling (chert lens) at 47.0 ft BGS. Bit free-falls: 62.0 ft to 68.0 ft BGS. BZA at 92.0 ft BGS = 0.3 ppm (steady), 1.1 ppm (max). Hard drilling (bedrock) at 93.0 ft BGS. Bit falling again 97.0 ft to 107.0 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1308</td>
<td>At 107.5 ft BGS, pilot bit in end of hole opener is close to the cut off casing top. Stop reaming. Clean out borehole, still few returns. Trip out tools, rig down hole opener/stabilizer. Tag bottom of borehole at 64.1 ft BGS (43.4 ft of mud fill). Calculate a borehole volume to 4.0 ft BGS of 73.6 cubic ft = 2.7 cubic yards. Cement delivery of 4.0 cubic yards scheduled for 1100 hrs tomorrow. Oversight departs; crew to remain and cleanup.</td>
</tr>
<tr>
<td></td>
<td>0942</td>
<td>Move drill rig off site, and back to pipeyard. Clean up location.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
</tr>
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<td>----------</td>
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</tr>
<tr>
<td>9-15-95</td>
<td>1125</td>
<td>Cement truck arrives. Pour entire 4 cubic yards of cement directly into borehole. (Danger of bridging in such a large diameter hole remote.) Tag cement level at 102.5 ft BGS; cement and fill collapse have been squeezed into the formation. W. Thedford (HSEA) approves use of bentonite to bridge voids in bedrock.</td>
</tr>
<tr>
<td></td>
<td>1300</td>
<td>Crew departs for bentonite.</td>
</tr>
<tr>
<td></td>
<td>1332</td>
<td>Crew returns, pour 34, 50-lb sacks of 3/8-in. bentonite aggregate into the borehole. Unhydrated bentonite level at 88.0 ft BGS. Pour 50 gals of potable water on top of the bentonite to hydrate. Calculate a borehole volume of 4.0 cubic yds. K. Jago (HSEA) approves use of concrete for borehole plug. Concrete delivery of 4.0 cubic yds scheduled for 0930 hrs tomorrow. Depart site.</td>
</tr>
<tr>
<td>9-18-95</td>
<td>0953</td>
<td>At GW-295 site. Tag hydrated bentonite at 87.0 ft BGS (bentonite swelled 1.0 ft).</td>
</tr>
<tr>
<td>9-18-95</td>
<td>1000</td>
<td>Concrete truck arrives. Pour entire 4 yds of concrete directly into the borehole. Concrete fills the borehole to 39.5 ft BGS. Clean up, cover open borehole, and depart.</td>
</tr>
<tr>
<td>9-19-95</td>
<td>0900</td>
<td>At GW-295 site. Tag concrete level at 39.7 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 1.6 cubic yds. Concrete order of 2 1/2 yds scheduled for 1330 hrs.</td>
</tr>
<tr>
<td></td>
<td>0906</td>
<td>Waiting for truck to return.</td>
</tr>
<tr>
<td>1353</td>
<td>1415</td>
<td>Escort cement truck to GW-295 site. Pour 2 1/2 cubic yds of concrete into the borehole. Concrete level to approximately 15 ft BGS. Clean up truck; truck departs, will return with 1 1/2 cubic yds of concrete.</td>
</tr>
<tr>
<td>1415</td>
<td>1458</td>
<td>Waiting for truck to return.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>9-19-95</td>
<td>1458</td>
<td>Truck returns, pours 1 1/2 cubic yds of concrete into borehole.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1507</td>
<td>Concrete to 1.0 ft BGS. Clean up truck and depart.</td>
</tr>
<tr>
<td>9-20-95</td>
<td>0900</td>
<td>Crew caps borehole with clay soil, then reclaims the site.</td>
</tr>
<tr>
<td></td>
<td>1000</td>
<td>P&amp;A of GW-295 is complete.</td>
</tr>
</tbody>
</table>
## Y-12 Plant Groundwater Protection Program

### Well Plugging and Abandonment Activity/Progress Report

**Well No.:** GW-297  
**Date:** START: 8-4-95  
**Finish:** 8-25-95  
**Location:** Chestnut Ridge Waste Pile  
**Drillers:** R. Phillips/H. Hall - Highland Drilling Co.  
**Helpers:** J. Gallagher/J. Monger - Highland Drilling Co.  
**Method:** A  
**Logged By:** Timothy Coffey  

### Activity/Comments

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Activity/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-4-95</td>
<td>0750</td>
<td>Arrive at GW-297 site. Drill rig and miscellaneous equipment on location. Uncap well: measure organic vapors in casing headspace = 0.0 ppm. Measure water level: well is dry. Tag bottom of well at 120.7 ft below ground surface (BGS). Note: The Subsurface Data Base (Y/TS-881/R2) reports the TD of GW-297 to be 120.0 ft. Crew arrives.</td>
</tr>
<tr>
<td></td>
<td>0845</td>
<td>W. Thedford and K. Jago (both of HSEA) on site. Examine distance of powerline to proposed mast position: 12 ft (falls within the required 15 ft stand-off distance). W. Thedford and K. Jago depart to consult with electrical authorities.</td>
</tr>
<tr>
<td></td>
<td>0845</td>
<td>0904 [cut off protective posts surrounding well. Cut off 1.2 ft of the well casing stick-up, and burn lifting holes in the remaining stick-up. Background radiological scan of location: alpha = 0 cpm, beta/ gamma = 50 cpm. Position drill rig over the well. ]</td>
</tr>
<tr>
<td>0904</td>
<td>0953</td>
<td>W. Thedford returns with D. Neubauer (Energy Systems) who examines the drill rig set-up regarding the power lines. Plan to install insulating sleeves over wire closest to proposed mast position. Drill crew on standby until this is complete. Revise site-specific health &amp; safety checklist to include this potential electrical hazard.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>8-4-95</td>
<td>1035</td>
<td>Line crew on site. Install 2 insulating sleeves on wire closest to well near closest point to the proposed mast position.</td>
</tr>
<tr>
<td></td>
<td>1044</td>
<td></td>
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<td>(cont.)</td>
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</tr>
<tr>
<td>1044</td>
<td>1053</td>
<td>Oversight conducts short briefing of site electrical hazards: pay attention to location of winch cables when picking up stabilizers, washover pipe, etc.</td>
</tr>
<tr>
<td>1053</td>
<td>1125</td>
<td>Start rig, raise mast. Rig up with first section of washover pipe; length = 15.8 ft (includes subadapter), add cutting shoe/bit (1.0 ft), total length = 16.8 ft, table height = 3.0 ft. Dimensions of washover bit: 4 1/2-in. inside diameter (ID), 6 1/2-in. outside diameter (OD).</td>
</tr>
<tr>
<td>1125</td>
<td>1132</td>
<td>Commence over wash of well casing (with concrete pad in place) using compressed air only. Over wash casing from 0.0 ft to 1.5 ft BGS. Cuttings from 0.0 ft to 0.7 ft BGS are medium light gray (N6) concrete pad fragments with medium dark gray (N4) aggregate. Cuttings from 0.7 ft to 1.5 ft BGS consist of medium gray (N5) to olive gray (5Y 4/1) cement fragments with abundant metal shards.</td>
</tr>
<tr>
<td>1132</td>
<td>1208</td>
<td>Stop at 1.5 ft BGS. Break for lunch.</td>
</tr>
<tr>
<td>1208</td>
<td>1526</td>
<td>Continue over wash of casing. Additional sections of washover pipe added as required. Over wash casing from 1.5 ft to 38.0 ft BGS. Breathing zone analysis (BZA) at 3.8 ft BGS = 0.0 ppm. Add water at 9.2 ft BGS. Lower explosive limit (LEL) reading at 15.0 ft BGS &lt;1% (8.0 ppm). BZA at 23.8 ft and 33.3 ft BGS both read 0.0 ppm. Cuttings from 1.5 ft to 38.0 ft BGS are a continuation of the cement fragments and metal shards of above. Beta/gamma scan of cuttings range from 50 to 70 cpm for the entire interval.</td>
</tr>
<tr>
<td>1526</td>
<td>1544</td>
<td>At 38.0 ft BGS. Clean out borehole. Clean up location. Secure site, and depart.</td>
</tr>
<tr>
<td>DATE</td>
<td>START</td>
<td>FINISH</td>
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<tr>
<td>8-7-95</td>
<td>0902</td>
<td>0946</td>
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<tr>
<td></td>
<td>0946</td>
<td>1203</td>
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<td>1413</td>
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<td>1443</td>
<td>1448</td>
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<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>8-7-95</td>
<td>1448</td>
<td>Remove broken pieces. Facilitate repairs. Re-install the repaired shaft. Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1543</td>
<td></td>
</tr>
<tr>
<td>8-8-95</td>
<td>0830</td>
<td>Arrive at GW-297 site. Crew conducts pre-work equipment inspections. Install rubber gaskets on washover pipe to keep the overspray to a minimum.</td>
</tr>
<tr>
<td></td>
<td>0859</td>
<td></td>
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<tr>
<td></td>
<td>1123</td>
<td>Commence over wash using compressed air and water. Over wash casing from 68.4 ft to 112.4 ft BGS. BZA at 72.9 ft and at 94.6 ft BGS both read 0.0 ppm. Drill</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rods begin dropping at 101.0 ft BGS, suspect bentonite seal. Cuttings from 68.4 ft to 101.0 ft BGS are a continuation of cement fragments and metal shards of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>above. Some obvious stainless steel centralizer fragments observed. Cuttings from 101.0 ft to 106.6 ft BGS consist predominantly of yellowish-gray (5Y 7/2) to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>light olive gray (5Y 5/2), hydrated bentonite agglomerations. Cuttings from 106.6 ft to 112.4 ft BGS are dark yellowish-orange (10YR 6/6), fine- to medium-grained</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sand (filter pack). Circulation begins to diminish at 106.6 ft, then is lost completely by 112.4 ft BGS.</td>
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<tr>
<td></td>
<td>1130</td>
<td>At 112.4 ft BGS. Pick washover pipe up off of the bottom, and secure.</td>
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<td></td>
<td>1205</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td>1205</td>
<td>1351</td>
<td>Break subadapter loose from washover pipe. Attach a chain to the casing and pull it out fairly easily. Extract 110.9 ft of 4.5-in. OD stainless steel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>casing (plus 1.2 ft removed prior to P&amp;A = 112.1 ft of casing recovered) and 10.7 ft of 4.5-in. OD stainless steel screen and cap. Total well materials</td>
</tr>
<tr>
<td></td>
<td></td>
<td>recovered from well GW-297 = 122.8 ft.</td>
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<td>DATE</td>
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<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>8-8-95</td>
<td>1351</td>
<td>Trip washer pipe out of the borehole.</td>
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<td>1502</td>
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<tr>
<td>(cont.)</td>
<td>1502</td>
<td>Rig up with a 9 7/8-in. diameter tricone bit on a stabilizer; total length = 20.2 ft, table height remains at 3.0 ft.</td>
</tr>
<tr>
<td></td>
<td>1515</td>
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<td></td>
<td>1515</td>
<td>Clean up, secure site, and depart.</td>
</tr>
<tr>
<td></td>
<td>1538</td>
<td></td>
</tr>
<tr>
<td>8-9-95</td>
<td>0906</td>
<td>Technical oversight assumed by V.R. Harness (SAIC). Arrive at GW-297 site. Crew conducts pre-work equipment inspections.</td>
</tr>
<tr>
<td></td>
<td>0919</td>
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<tr>
<td></td>
<td>0919</td>
<td>Commence reaming wellbore using compressed air only. Ream wellbore from 0.0 ft to 42.0 ft BGS. Cement fragments in returns.</td>
</tr>
<tr>
<td></td>
<td>1138</td>
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</tr>
<tr>
<td></td>
<td>1138</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1226</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1226</td>
<td>Continue reaming wellbore. Ream from 42.0 ft to 121.0 ft BGS. BZA at 92.2 ft BGS = 0.0 ppm, LEL &lt;1%. Cement continues to 101.0 ft BGS. Below 101.0 ft BGS, cuttings consist of bentonite and sand (filter pack). Lose circulation at 114.0 ft BGS. Encounter rock (hard drilling) at 120.0 ft, still no circulation. BZA at 120.0 ft BGS = 0.0 ppm, LEL &lt;1%.</td>
</tr>
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<td>1335</td>
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<tr>
<td></td>
<td>1335</td>
<td>At 121.0 ft BGS. Try to clean out borehole (no returns). Trip out tools. Tag bottom of borehole; loose mud at 90.0 ft BGS, heavy mud/ fill at 111.0 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1415</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1415</td>
<td>Run 1.5-in. OD PVC tremie into the borehole through mud to 117.0 ft BGS. Calculate a borehole volume from 117.0 ft to assumed base of surface casing at 101.0 ft of 8.5 cubic ft, equivalent to 7.2 sacks of Type I cement.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
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</tr>
<tr>
<td>8-9-95 (cont.)</td>
<td>1447</td>
<td>Mix and pump-tremie 12 sacks (14.2 cubic ft) of neat, Type I Portland cement (average grout weight of 15.4 lbs/gal) into the borehole.</td>
</tr>
<tr>
<td></td>
<td>1547</td>
<td>Pull out tremie pipe. Clean up. Secure site and depart.</td>
</tr>
<tr>
<td>8-10-95</td>
<td>0830</td>
<td>Arrive at GW-297 site. Tag cement level at 113.0 ft BGS. HSEA approves using bentonite to plug remaining borehole to surface casing. Crew departs the site to get bentonite.</td>
</tr>
<tr>
<td></td>
<td>1145</td>
<td>Crew returns. Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1247</td>
<td>Pour 10, 50-lb sacks of 3/8-in. bentonite aggregate into the borehole. Unhydrated bentonite level at 95.0 ft BGS. Pour 10 gallons of potable water into the borehole to hydrate the bentonite. Secure site and depart.</td>
</tr>
<tr>
<td>8-11-95</td>
<td>0900</td>
<td>Technical oversight resumed by T. Coffey (SAIC). Arrive at GW-297 site. Tag hydrated bentonite at 94.7 ft BGS (bentonite swelled 0.3 ft).</td>
</tr>
<tr>
<td></td>
<td>0923</td>
<td>Rig up with first section of washover pipe; total length = 26.3 ft (includes subadapter and cutting shoe), table height = 2.7 ft. Dimensions of washover bit: 11 7/8-in. ID, 13 3/4-in. OD.</td>
</tr>
</tbody>
</table>
|            | 0946  | Commence over wash of surface casing using compressed air only. Overwash casing from 0.0 ft to 22.6 ft BGS. BZA at 4.8 ft and 18.5 ft BGS both read 0.0 ppm. Cuttings from 0.0 ft to 22.6 ft BGS consist of dark gray (N3) to medium dark gray (N4) cement fragments; light brown (5YR 5/6), moist clay with moderate yellowish-brown (10YR 5/4) chert fragments; and metal shavings.
<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-11-95</td>
<td></td>
<td>*(especially from near the bottom of the interval). Beta/gamma scan of cuttings = 40 cpm for the entire interval.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
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</tr>
<tr>
<td>1025</td>
<td>1033</td>
<td>At 22.6 ft BGS. Trip out washover pipe and rig down.</td>
</tr>
<tr>
<td>1033</td>
<td>1126</td>
<td>Push in an 8.0-ft section of 15 3/8-in. ID, 16-in. OD steel conductor casing to maintain the integrity of the borehole collar. Casing stick-up = 2.5 ft. Cut off 1.5 ft of the stick-up. New stick-up = 1.0 ft. Burn lifting holes in the surface casing.</td>
</tr>
<tr>
<td>1126</td>
<td>1146</td>
<td>Rig back up with the lead section of washover pipe, and trip in to borehole. Table height remains at 2.7 ft.</td>
</tr>
<tr>
<td>1146</td>
<td>1230</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td>1230</td>
<td>1424</td>
<td>Add another section of washover pipe to string and continue over wash. Over wash casing from 22.6 ft to 32.3 ft BGS. BZA at 32.0 ft BGS = 0.0 ppm. Cuttings from 22.6 ft to 32.3 ft BGS are a continuation of above.</td>
</tr>
<tr>
<td>1424</td>
<td>1430</td>
<td>At 32.3 ft BGS. Clean out borehole. Shut off drill rig. Crew to remain and clean up location, oversight departs.</td>
</tr>
<tr>
<td>8-14-95</td>
<td>0835</td>
<td>Arrive at GW-297 site. Crew conducts pre-work equipment inspection.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>8-14-95 (cont.)</td>
<td>0843</td>
<td>Commence over wash. Over wash surface casing from 32.3 ft to 44.0 ft BGS. Making a lot of mud and water from approximately 35 ft BGS (suspect a perched water zone). Called K. Jago (HSEA) to report mud production. Kevin states a cuttings pit is not recommended, divert mud to ditch nearby and keep an eye on it. BZA at 38.3 ft BGS = 0.0 ppm. Cuttings from 32.3 ft to 44.0 ft BGS are a continuation of above.</td>
</tr>
<tr>
<td></td>
<td>1136</td>
<td></td>
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<tr>
<td></td>
<td>1211</td>
<td>At 44.0 ft BGS. Break for lunch.</td>
</tr>
<tr>
<td>1221</td>
<td>1251</td>
<td>Continue overwash. Overwash casing from 44.0 ft to 46.2 ft BGS. Cuttings continue as above.</td>
</tr>
<tr>
<td>8-15-95</td>
<td>0805</td>
<td>Arrive at GW-297 site. Check on mud run-off: has just reached fence line below gravel haul road. Plan to have crew place straw bales along the fence as a filter/dam.</td>
</tr>
<tr>
<td></td>
<td>0842</td>
<td></td>
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<tr>
<td></td>
<td>0852</td>
<td>Crew arrives, conducts pre-work equipment inspection.</td>
</tr>
<tr>
<td>0852</td>
<td>1102</td>
<td>Commence over wash. Over wash surface casing from 46.2 ft to 61.2 ft BGS. BZA at 48.0 ft BGS and 60.6 ft BGS both read 0.0 ppm. Cuttings from 46.2 ft to 61.2 ft BGS are a continuation of above: clay content appears to be increasing while the amount of cement decreases.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>8-15-95</td>
<td>1102</td>
<td>At 61.2 ft BGS. Break subadapter loose from washover pipe.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td>Oversight departs to check on mud flow; mud is ponding in a small embayment 10-20 ft beyond the straw bale dam, and does not appear to be a threat to any surface water. Return to site.</td>
</tr>
<tr>
<td></td>
<td>1143</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1221</td>
<td>Rig up and continue over wash. Over wash casing from 61.2 ft to 81.2 ft BGS. Lose circulation at approximately 64 ft BGS. BZA at 73.2 ft BGS = 0.5 ppm (steady), 23 ppm (maximum). Crew had been using a lot of alcohol-based soap with the drilling water, even on the outside of the washover pipe (suspected source of high breathing zone readings). Cuttings (none collected due to lost circulation) assumed to be continuation of above.</td>
</tr>
<tr>
<td></td>
<td>1422</td>
<td>At 81.2 ft BGS. Break subadapter loose from washover pipe, and from drill head. Thread clevis into drill head. Attach a chain to surface casing and attempt to pull out; casing does not budge.</td>
</tr>
<tr>
<td></td>
<td>1454</td>
<td>Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>8-16-95</td>
<td>0916</td>
<td>Arrive at GW-297 site. Rig up and commence over wash. Over wash casing from 81.2 ft to 101.2 ft BGS. BZA at 92.0 ft BGS = 0.0 ppm. Drilling rate increases at 92.5 ft BGS, then decreases at 99.0 ft BGS. No circulation for entire interval.</td>
</tr>
<tr>
<td></td>
<td>1059</td>
<td>At 101.2 ft BGS. Attempt to pull out casing; casing does not budge.</td>
</tr>
<tr>
<td></td>
<td>1132</td>
<td>Break for lunch.</td>
</tr>
</tbody>
</table>
## Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

### WELL PLUGGING AND ABANDONMENT

#### ACTIVITY/PROGRESS REPORT - continued

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<th>ACTIVITY/COMMENTS</th>
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<tbody>
<tr>
<td>8-16-95</td>
<td>1225</td>
<td>1244</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td>Attempt to pull casing again; casing still does not move, chain slips out of lifting hole.</td>
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<tr>
<td></td>
<td>1244</td>
<td>1340</td>
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<tr>
<td></td>
<td></td>
<td>Crew fixing a leak in the drill rig exhaust system.</td>
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<tr>
<td></td>
<td>1340</td>
<td>1357</td>
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<tr>
<td></td>
<td></td>
<td>Make yet another attempt to pull out casing using a bigger, stronger chain; also unsuccessful. Crew to perform additional maintenance on drill rig. Oversight departs.</td>
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<tr>
<td>8-17-95</td>
<td>0838</td>
<td>0910</td>
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<td></td>
<td>Arrive at GW-297 site. Add another section of washover pipe to tools.</td>
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<tr>
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<td>0910</td>
<td>0938</td>
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<tr>
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<td></td>
<td>Connection made, commence over wash. Overwash casing from 101.4 ft to 105.0 ft BGS. Still no circulation. Drilling rate increases briefly at 104.0 ft BGS, then becomes slow and ratty. BZA at 104.8 ft BGS = 0.0 ppm.</td>
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<tr>
<td></td>
<td>0938</td>
<td>1010</td>
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<tr>
<td></td>
<td></td>
<td>At 105.0 ft BGS. Pull washover pipe up to last connection. Break out washover pipe and rig down. Remove subadapter from drill head.</td>
</tr>
<tr>
<td></td>
<td>1010</td>
<td>1155</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thread clevis into drill head. Attach a chain to surface casing, and begin pulling out; casing comes out fairly easily.</td>
</tr>
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<td>1155</td>
<td>1229</td>
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<td></td>
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<td>Break for lunch.</td>
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<td>1229</td>
<td>1420</td>
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<td></td>
<td>Continue pulling out casing. Extract 106.1 ft of 10-in. ID, 10 3/4-in. OD steel casing.</td>
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<td>1420</td>
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<td></td>
<td>Clean up, secure site, and depart.</td>
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<td>START</td>
<td>FINISH</td>
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<td>8-18-95</td>
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<td>0816</td>
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<tr>
<td>8-21-95</td>
<td>0942</td>
<td>Commence reaming borehole using compressed air and water. Ream borehole from 0.0 ft to 67.9 ft BGS. Ratty drilling at 25.5 ft BGS, and at 65.0 ft BGS. Hard, slow drilling at 65.6 ft BGS. No returns to surface during entire interval.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
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</tr>
<tr>
<td>1009</td>
<td>1025</td>
<td>At 67.9 ft BGS. Trip out 1 rod. Drillers are concerned about getting stuck. Trip back in, have to re-drill the last 10 ft.</td>
</tr>
<tr>
<td>1025</td>
<td>1052</td>
<td>Trip out tools. Tag bottom of borehole at 44.1 ft BGS (23.8 ft of fill). Report status to K. Jago (HSEA) who directs to stop reaming, make a bentonite aggregate plug a few feet thick, then grout the borehole.</td>
</tr>
<tr>
<td>1052</td>
<td>1130</td>
<td>Crew departs for bentonite.</td>
</tr>
<tr>
<td>1130</td>
<td>1142</td>
<td>Pour 10, 50-lb sacks of 3/8-in. bentonite aggregate into the borehole. Unhydrated bentonite at 41.8 ft BGS (2.3-ft thick plug). Add 10 gallons of potable water to borehole to hydrate the bentonite. Calculate a borehole volume to 4.0 ft BGS of 52.9 cubic ft = 2.0 cubic yds. Secure site and depart. Grout delivery scheduled for 1100 hrs tomorrow.</td>
</tr>
<tr>
<td>8-22-95</td>
<td>1013</td>
<td>Arrive at GW-297 site. Tag bentonite level at 41.8 ft BGS (no upward swell of bentonite).</td>
</tr>
<tr>
<td>1013</td>
<td>1045</td>
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</tr>
<tr>
<td>1045</td>
<td>1158</td>
<td>At Portal 13, waiting to escort grout truck to well site.</td>
</tr>
<tr>
<td>1158</td>
<td>1218</td>
<td>Return to GW-297 site with grout truck. Pour 2 cubic yds of neat cement into borehole (approval to pour grout directly into hole by K. Jago - HSEA). Liquid cement level to approximately 20 ft BGS. Order another yd to top-off hole.</td>
</tr>
<tr>
<td>DATE</td>
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</tr>
<tr>
<td>8-22-95</td>
<td>1218-1223</td>
<td>Clean up, cement truck departs.</td>
</tr>
<tr>
<td>(cont.)</td>
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<tr>
<td></td>
<td>1223-1256</td>
<td>Wait on second cement truck.</td>
</tr>
<tr>
<td></td>
<td>1256-1305</td>
<td>Second cement truck on site. Pour 1 cubic yd of neat cement directly into the borehole. Liquid cement level remains at approximately 20 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1305-1317</td>
<td>Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>8-23-95</td>
<td>0742-0813</td>
<td>At GW-297 site. Tag cement level at 21.4 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 24.4 cubic ft = 0.9 cubic yds. Highland Drilling Co. supervisor orders 1 cubic yd of cement for immediate delivery.</td>
</tr>
<tr>
<td></td>
<td>0813-0849</td>
<td>At Portal 13, waiting for cement truck.</td>
</tr>
<tr>
<td></td>
<td>0849-0907</td>
<td>Cement truck at GW-297 site; pour 1 cubic yd of neat cement into borehole. Liquid cement to approximately 11 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>0907-0916</td>
<td>Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>8-24-95</td>
<td>0755-0848</td>
<td>At GW-297 site. Tag cement level at 12.0 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 11.2 cubic ft, equivalent to 9.5 sacks of cement.</td>
</tr>
<tr>
<td></td>
<td>0848-0922</td>
<td>Mix and pour 9 sacks (10.6 cubic ft) of neat, Type I Portland cement (grout weight of 13.6 lbs/gal) into the borehole. Out of water. Liquid cement level is at approximately 7 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>0922-0938</td>
<td>Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>8-24-95</td>
<td>1349-1435</td>
<td>Return to GW-297 site. Mix and pour another 8 sacks (9.4 cubic ft) of neat, Type I Portland cement into the borehole. Liquid cement to 1 ft BGS.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1435-1448</td>
<td>Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>8-25-95</td>
<td>0855-0912</td>
<td>At GW-297 site. Tag cement level at 2.9 ft BGS. Cap borehole to 0.8 ft BGS with 3/8-in. bentonite aggregate (due to large borehole volume, and lack of clay cuttings remaining at site). Cap remaining borehole with clay soil.</td>
</tr>
</tbody>
</table>

P&A of well GW-297 is complete.
<table>
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<tr>
<th>DATE</th>
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</table>
| 7-16-96| 1014   | **Arrive at GW-320 site. Uncap well: organic vapors in casing headspace = 0.0 ppm. Measure water level at 16.5 ft below ground surface (BGS). Tag bottom of well (solid) at 110.3 ft BGS. Note: The Subsurface Data Base (Y/TS-881/R3) reports the total depth of well GW-320 to be 110.0 ft. Due to the proximity of the well directly uphill of a wetlands area, and personnel health and safety concerns, HSEA has granted a deviation from the plugging and abandonment procedure. This well will be grouted with casing remaining in the borehole.**
| 7-16-96| 1024   | **Slowly pour 2, 50-lb sacks of 3/8-in. bentonite aggregate into the well. Unhydrated bentonite level is at 96.8 ft BGS. Bentonite to hydrate approximately 4 hours. Depart site.**
| 1410   | 1442   | **Return to GW-320 site. Tag hydrated bentonite level at 91.6 ft BGS (bentonite swelled 5.2 ft). Calculate a casing volume of 9.4 cubic ft, equivalent to 8.0 sacks of Type I Portland cement.**
| 1442   | 1557   | **Run 1.0-in. inside diameter (ID) PVC tremie pipe into well casing to 87.0 ft BGS. Mix and pump-tremie approximately 8 sacks (9.4 cubic ft) of neat, Type I Portland cement (with average grout weight of 13.1 lbs/gal) into the well. Circulate water, then 100% cement.**
| 1557   | 1629   | **Pull out tremie pipe. Clean up. Depart site.**
<table>
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<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-17-96</td>
<td>0857</td>
<td>At GW-320 site. Tag cement level in well at 1.0 ft below top of casing (BTOC). The cement is above the ground surface so no more will be added. Plan to cut off the casing tomorrow. Depart site.</td>
</tr>
<tr>
<td></td>
<td>0902</td>
<td></td>
</tr>
<tr>
<td>7-18-96</td>
<td>0746</td>
<td>At GW-320 site. Crew breaks up the concrete pad and removes the fragments from the wellhead. No evidence of surface casing below the pad. Oversight departs.</td>
</tr>
<tr>
<td></td>
<td>0823</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1500</td>
<td>Oversight returns to GW-320 site. Crew first cuts protective casing, then cuts well casing off flush with the ground surface.</td>
</tr>
<tr>
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<td>1558</td>
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</tr>
</tbody>
</table>

Note: No intrusive work was performed in the decommissioning of this well, hence no Cuttings Field Screening/Disposal sheet or Equipment Decontamination Summary was required.
## Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

### WELL PLUGGING AND ABANDONMENT

#### ACTIVITY/PROGRESS REPORT

| LOCATION: | Ash Disposal Basin |
| FOREMAN: | G. Shillings - Highland Drilling Co. |
| HELPERS: | D. Williford, H. Hall, J. Gallaher |
| DRILL: | NA |

#### PAGE 1 of 3

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
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<tbody>
<tr>
<td>7-16-96</td>
<td>1000</td>
<td>Start activity.</td>
</tr>
<tr>
<td>7-16-96</td>
<td>1009</td>
<td>Arrive at GW-321 site. Uncap well. Organic vapors in casing headspace = 0.0 ppm. Measure water level at 17.2 ft below ground surface (BGS). Tag bottom of well (solid) at 98.4 ft BGS. Note: The Subsurface Data Base (Y/TS-881/R3) reports the total depth of well GW-321 to be 98.0 ft. Due to the proximity of the well directly uphill of a wetlands area, and personnel health and safety concerns, HSEA has granted a deviation from the plugging and abandonment procedure. This well will be grouted with casing remaining in the borehole.</td>
</tr>
<tr>
<td>1009</td>
<td>1012</td>
<td>Begin pouring 3/8-in. bentonite aggregate into the well. The bentonite bridges off at approximately 20 ft BGS after 1.5, 50-lb sacks of bentonite. Depart to get tremie pipe.</td>
</tr>
<tr>
<td>1105</td>
<td>1116</td>
<td>Return to GW-321 site with tremie pipe. Run tremie pipe into well, and push through the bridged bentonite. There appears to be another plug of bentonite beginning at approximately 50 ft BGS. Do not have enough tremie pipe to reach the second bentonite plug. Depart site.</td>
</tr>
<tr>
<td>DATE</td>
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<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>7-16-96</td>
<td>1557</td>
<td>At GW-321 site. Run additional tremie pipe into well. Able to push through the second bentonite plug. Tag bentonite level at 86.7 ft BGS (0.6 ft above the top of the screen). Calculate a casing volume to the top of the casing of 8.9 cubic ft, equivalent to 7.5 sacks of Type I cement.</td>
</tr>
<tr>
<td></td>
<td>1607</td>
<td>(cont.)</td>
</tr>
<tr>
<td>7-16-96</td>
<td>1557</td>
<td>At GW-321 site. Run additional tremie pipe into well. Able to push through the second bentonite plug. Tag bentonite level at 86.7 ft BGS (0.6 ft above the top of the screen). Calculate a casing volume to the top of the casing of 8.9 cubic ft, equivalent to 7.5 sacks of Type I cement.</td>
</tr>
<tr>
<td></td>
<td>1607</td>
<td>Pump approximately 4 sacks (4.7 cubic ft) of neat Type I Portland cement (grout weight of 13.6 lbs/gal) left over from a batch mixed for GW-320 into the well casing. Circulate water.</td>
</tr>
<tr>
<td></td>
<td>1618</td>
<td>Out of cement. Pull out tremie pipe. Clean up, depart site.</td>
</tr>
<tr>
<td>7-17-96</td>
<td>0857</td>
<td>At, GW-321 site. Tag cement level at 20.3 ft below top of casing (BTOC). Calculate a casing volume to the top of 2.0 cubic ft, equivalent to 1.7 sacks of Type I cement.</td>
</tr>
<tr>
<td></td>
<td>0902</td>
<td>Run 1-in. inside diameter (ID) PVC tremie pipe into the casing to 19.0 ft BTOC.</td>
</tr>
<tr>
<td></td>
<td>0903</td>
<td>Mix and pump-tremie 2 sacks (2.4 cubic ft) of neat, Type I Portland cement (grout weight = 13.8 lbs/gal) into the well. Circulate water, then 100% cement. Liquid cement fills the well casing to the top.</td>
</tr>
<tr>
<td></td>
<td>0923</td>
<td>Pull out tremie pipe. Clean up. Depart site.</td>
</tr>
<tr>
<td>7-18-96</td>
<td>0746</td>
<td>At GW-321 site. Cement still fills the casing to the top. Break up the concrete pad and remove the fragments from around the wellhead. No evidence of surface casing beneath the pad. Crew will cut off the protective casing and well casing flush with the ground surface. Oversight departs.</td>
</tr>
<tr>
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<td>0823</td>
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<tr>
<td>7-18-96</td>
<td>1500</td>
<td>Oversight returns to GW-321 site. Both the protective casing and well casing have been cut off flush with the ground surface.</td>
</tr>
<tr>
<td></td>
<td>1505</td>
<td>P&amp;A of well GW-321 is complete.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td>Note: No intrusive work was performed in the decommissioning of this well hence no Cuttings Field Screening/Disposal Sheet or Equipment Decontamination Summary was required.</td>
</tr>
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<tr>
<td>8-28-95</td>
<td>1400</td>
<td><strong>Arrive at GW-448 site. Uncap well: organic vapors in casing headspace = 0.0 ppm, lower explosive limit (LEL) reading &lt;1%</strong> (5.6 ppm). Background radiological scan of location: alpha = 0 cpm, beta/gamma = 70 cpm. Measure water level at 7.7 ft below ground surface (BGS). Tag bottom of well (solid) at 44.6 ft BGS. Note: The subsurface data base (Y/TS-881/R2) reports the depth of well GW-448 to be 44.5 ft.</td>
</tr>
<tr>
<td></td>
<td>1443</td>
<td><strong>Move drill rig onto the site and position over the well. Set up site and prepare to drill tomorrow. Depart site.</strong></td>
</tr>
<tr>
<td>8-29-95</td>
<td>0858</td>
<td><strong>Arrive at GW-448 site. Start drill rig, raise the mast.</strong></td>
</tr>
<tr>
<td></td>
<td>0908</td>
<td><strong>Wrap a chain around the conductor casing, and extract 2.3 ft of 6 5/8-in. outside diameter (OD) steel casing. Cut off the 2 3/8-in. OD PVC well casing stick-up flush with ground surface, remove 1.6 ft of the casing. Rig up with an 8 3/4-in. diameter tricone bit on a subadapter; total length = 4.3 ft, table height = 3.0 ft.</strong></td>
</tr>
</tbody>
</table>
|       | 0920  | **Commence drilling up the casing/reaming the wellbore using compressed air only. Drill/ream from 0.0 ft to 45.6 ft BGS.** Cuttings from 0.0 ft to 4.0 ft BGS are predominantly medium gray (N5) cement fragments with light brown (5 YR 5/6), dry, stiff clay; and white (N9) PVC. Breathing zone analysis (BZA) at 2.0 ft BGS = 0.0 ppm. Encounter moisture and weathered rock at 4.0 ft BGS. BZA at 4.0 ft BGS = 0.0 ppm. Encounter small amounts of...**
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

#### WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued

<table>
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<tr>
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<tbody>
<tr>
<td>8-29-95</td>
<td></td>
<td>moisture at 11.6 ft and 14.7 ft BGS. BZA at 14.5 ft BGS = 0.0 ppm. Encounter fresh rock at 17.3 ft BGS. Cuttings from 4.0 ft to 17.3 ft BGS consist of light olive gray (5Y 5/2) to moderate yellowish-brown (10YR 5/4), weathered and stained, thinly laminated shale with light gray (N7) cement fragments and white (N9) PVC fragments. BZA at 22.3 ft BGS = 0.0 ppm. Encounter water at 27.0 ft BGS. BZA at 30.0 ft and 40.3 ft BGS both read 0.0 ppm. Possible void from 30.0 ft to 31.3 ft BGS as the bit appears to free-fall. Cuttings from 17.3 ft to 45.6 ft BGS are: grayish-black (N2) to dusky blue (5PB 3/2), massive, pelletal micrite; brownish-gray (5YR 4/1), massive intra-micrite; dark gray (N3), thinly laminated shale; very pale orange (10YR 8/2) cement fragments; and white (N9) PVC fragments. No obvious sand filter pack was observed. Beta/gamma scan of cuttings range 60-80 cpm for the entire interval.</td>
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<td></td>
<td>1036</td>
<td>1045 At 45.6 ft BGS. Borehole is making a little water now. Trip out 1 rod. Shut off drill rig.</td>
</tr>
<tr>
<td></td>
<td>1045</td>
<td>1105 Wait for water to accumulate in borehole to aid in cleaning out debris.</td>
</tr>
<tr>
<td></td>
<td>1105</td>
<td>1152 Clean out borehole. Trip out tools. Tag bottom of borehole at 45.4 ft BGS (0.2 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 17.4 cubic ft, equivalent to 14.7 sacks of Type I cement. Lower mast, and move drill rig off the location.</td>
</tr>
<tr>
<td></td>
<td>1152</td>
<td>1234 Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1234</td>
<td>1238 Run 1.5-in. OD PVC tremie pipe into the borehole to 38.0 ft BGS.</td>
</tr>
<tr>
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<td>TIME</td>
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</tr>
<tr>
<td>8-29-95</td>
<td>1230-1353</td>
<td>Mix and pump-tremie 13 sacks (15.3 cubic ft) of neat, Type I Portland cement (average grout weight of 12.7 lbs/gal) into the borehole. Circulate water, then 100% cement.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1353-1415</td>
<td>Pull out tremie pipe. Clean up. Secure site, and depart.</td>
</tr>
<tr>
<td>8-30-95</td>
<td>0830-0851</td>
<td>At GW-448 site. Tag cement level at 4.0 ft BGS. Cap remaining borehole with clay soil.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P&amp;A of well GW-448 is complete.</td>
</tr>
<tr>
<td>DATE</td>
<td>START</td>
<td>FINISH</td>
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<td>8-28-95</td>
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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

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<tbody>
<tr>
<td>8-28-95</td>
<td>1325</td>
<td>Encounter weathered rock at 13.3 ft BGS. Cuttings from 6.0 ft to 13.3 ft BGS consist of: dark yellowish-brown (10YR 4/2), moist clay; very pale orange (10YR 8/2), fine- to medium-grained quartz sand (filter pack); and white (N9) PVC fragments. Encounter fresh rock at 19.0 ft BGS. Cuttings from 13.3 ft to 19.0 ft BGS are: light olive gray (5Y 5/2) to moderate yellowish-brown (10YR 5/4), weathered and stained, thinly laminated shale; filter sand and PVC fragments as above. Cuttings from 19.0 ft to 20.0 ft BGS are: medium dark gray (N4) and grayish-red (5R 4/2), thinly laminated shale. Beta/gamma scan of cuttings range 70-80 cpm for the entire interval.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1235</td>
<td>At 20.0 ft BGS. Clean out borehole. Trip out tools. Tag bottom of borehole at 19.5 ft BGS (0.5 ft of fill). Lower mast, and move drill rig off the location. Calculate a borehole volume to 4.0 ft BGS of 6.5 cubic ft, equivalent to 5.5 sacks of Type I cement.</td>
</tr>
<tr>
<td>1325</td>
<td>1346</td>
<td>Mix and pour 7 sacks (8.3 cubic ft) of neat, Type I Portland cement (grout weight of 12.8 lbs/gallon) directly into the borehole. Liquid cement fills the borehole to the ground surface.</td>
</tr>
<tr>
<td>1346</td>
<td>1352</td>
<td>Clean up. Secure site and depart.</td>
</tr>
<tr>
<td>8-29-95</td>
<td>0836</td>
<td>At GW-452 site. Tag cement level at 3.0 ft BGS. Cap remaining borehole with clay soil.</td>
</tr>
<tr>
<td>0847</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P&amp;A of well GW-452 is complete.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
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<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4-29-96</td>
<td>0938</td>
<td>Arrive at GW-660 site. S. Jones (HSEA) conducts site-specific Health &amp; Safety briefing. Notable items include: no sediment, cuttings, or water discharges to the creek; well site adjacent to active construction site.</td>
</tr>
<tr>
<td></td>
<td>0954</td>
<td>Move drill rig onto location, and begin setting up the site. Uncap the well: organic vapors in the casing headspace = 0.0 ppm, mercury vapors in the casing headspace = 0.0 mg/m³. Measure water level at 3.7 ft below ground surface (BGS). Tag bottom of well (solid) at 11.6 ft BGS. Note: The Subsurface Data Base (Y/TS-881/R3) reports the total depth of the well to be 10.4 ft BGS. Back ground radiological scan of the location: alpha = 0 cpm, beta/gamma - 60-80 cpm.</td>
</tr>
<tr>
<td>1018</td>
<td>1018</td>
<td>Break up concrete pad, and remove fragments from wellhead.</td>
</tr>
<tr>
<td>1030</td>
<td>1039</td>
<td>Rig up with 12-in. outside diameter (OD), 8 1/4-in. inside diameter (ID) hollow-stem augers; lead flyte is 5.3 ft long (subsequent flytes are 5.0 ft long). Crew discovers they do not have the correct auger bolts with them.</td>
</tr>
<tr>
<td>1039</td>
<td>1123</td>
<td>Crew off getting bolts for the augers.</td>
</tr>
<tr>
<td>1123</td>
<td>1128</td>
<td>Crew returns; finish rigging up lead auger flyte.</td>
</tr>
</tbody>
</table>
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

#### WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-29-96</td>
<td>1128</td>
<td>Commence augering around the well. Auger from 0.0 ft to 7.3 ft BGS. Breathing zone analysis at 0.5 ft BGS = 0.0 ppm. Cuttings from 0.0 to 0.8 ft BGS are: dark reddish-brown (10R 3/4) to moderate brown (5YR 3/4), moist, clayey soil with medium light gray (N5) concrete fragments. Cuttings from 0.8 ft to 1.5 ft BGS consist of: dark yellowish-brown (10YR 4/2) to grayish-brown (5YR 3/2), moist, silty clay with fragments of moderate yellowish-brown (10YR 5/4), weathered shale and sandy shale. Mercury vapor of cuttings at 2.8 ft BGS = 0.0 mg/m³. BZA at 4.0 ft BGS = 0.0 ppm. Cuttings become very moist at 5.0 ft BGS; a humic odor is noted. Cuttings from 1.5 ft to 7.3 ft BGS are: greenish-black (5G 2/1), moist, silty clay.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1156</td>
<td></td>
</tr>
<tr>
<td>1156</td>
<td>1230</td>
<td>At 7.3 ft BGS. The well casing along with the protective casing has dropped down inside the augers. Trip augers out of the borehole: casings are stuck inside the augers. Working to extricate the casings and/or separate auger flytes. Auger flytes finally separate, and casing removed from lead auger flyte. Recover 7.0 ft of 6 5/8-in. OD steel casing and 6.2 ft of 2 3/8-in. OD stainless steel well casing still cemented inside the protective casing. Bottom of well casing is distorted where it twisted off, the rest of the well casing and screen are still in the borehole.</td>
</tr>
<tr>
<td>1230</td>
<td>1305</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td>1305</td>
<td>1310</td>
<td>Rig auger string back up; trip back into borehole.</td>
</tr>
<tr>
<td>1310</td>
<td>1326</td>
<td>Continue augering. Auger the wellbore from 7.3 ft to 11.6 ft BGS. BZA at 8.8 ft BGS = 0.0 ppm. Very hard drilling at 11.6 ft BGS (bottom of wellbore). Cuttings from 7.3 ft to 11.6 ft BGS are: greenish-black (5G 2/1), moist silty clay with minor sand (filter pack).</td>
</tr>
</tbody>
</table>
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

#### WELL PLUGGING AND ABANDONMENT

ACTIVITY/PROGRESS REPORT - continued

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-29-96</td>
<td>1326</td>
<td>Auger refusal at 11.6 ft BGS. Trip out augers. Tag bottom of borehole at 8.3 ft BGS (3.3 ft of fill). Water level at 3.6 ft BGS.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1347</td>
<td>Unable to recover any more well casing or screen. Calculate a borehole volume to 4.0 ft BGS of 3.4 cubic ft, equivalent to 4.9 sacks of bentonite aggregate.</td>
</tr>
<tr>
<td></td>
<td>1347</td>
<td>Pour 7.50-lb sacks of 3/8-in. bentonite aggregate into the borehole.</td>
</tr>
<tr>
<td></td>
<td>1354</td>
<td>Unhydrated bentonite fills the borehole to 1.3 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1354</td>
<td>Pull the four protective posts out of the ground.</td>
</tr>
<tr>
<td></td>
<td>1411</td>
<td>Fill in remaining borehole and post holes with clay soil. Rig down auger truck.</td>
</tr>
<tr>
<td></td>
<td>1411</td>
<td>Crew off-site getting cutting torches and reclamation supplies.</td>
</tr>
<tr>
<td></td>
<td>1430</td>
<td>Crew returns, beginning cutting up extracted casing to be screened.</td>
</tr>
<tr>
<td></td>
<td>1515</td>
<td>Clean up site. Collect solid wastes to be screened, and stage adjacent to well site. Spread seed and straw over well site. Depart site.</td>
</tr>
<tr>
<td></td>
<td>1558</td>
<td>P&amp;A of well GW-660 is complete.</td>
</tr>
<tr>
<td></td>
<td>1619</td>
<td>NOTE: Headspace analyses of cuttings composites exceeded the disposal limits, even after re-sealing and re-sampling after a 1-hr incubation period.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A headspace analysis of cuttings after allowing 24-hr aeration measured within the disposal limits.</td>
</tr>
</tbody>
</table>
**WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT**

**LOCATION:** East Fork Poplar Creek  
**OPERATOR:** H. Hall - Highland Drilling Co.  
**HELPER:** G. Shillings - Highland Drilling Co.  
**DRILL:** Altec Auger Truck  
**DATE:** START: 4-30-96  
**DATE:** FINISH: 4-30-96  
**METHOD:** A  
**LOGGED BY:** Timothy Coffey - SAIC

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-30-96</td>
<td>1035</td>
<td>Arrive at GW-669 site. Drill rig is already on site. S. Jones (HSEA) conducts site-specific Health &amp; Safety briefing. Notable items include: possible mercury contamination, although this is unlikely since soil and water sample data from the area yielded &quot;clean&quot; results.</td>
</tr>
<tr>
<td></td>
<td>1104</td>
<td>剖开井: 有机化合物在桩内大气空间 = 0.0 ppm, mercury vapors in casing headspace = 0.0 mg/m³. Measure water level at 4.4 ft below ground surface (BGS). Tag bottom of well (solid) at 7.3 ft BGS. Note: The Subsurface Data Base (Y/TSS-881/R3) reports the total depth of well GW-669 to be 6.7 ft, and the depth of the wellbore to be 9.4 ft BGS. Background radiological scan of the location: alpha = 0 cpm, beta/gamma = 50-60 cpm.</td>
</tr>
<tr>
<td>1104</td>
<td>1116</td>
<td>剖开井: 有机化合物在桩内大气空间 = 0.0 ppm, mercury vapors in casing headspace = 0.0 mg/m³. Measure water level at 4.4 ft below ground surface (BGS). Tag bottom of well (solid) at 7.3 ft BGS. Note: The Subsurface Data Base (Y/TSS-881/R3) reports the total depth of well GW-669 to be 6.7 ft, and the depth of the wellbore to be 9.4 ft BGS. Background radiological scan of the location: alpha = 0 cpm, beta/gamma = 50-60 cpm.</td>
</tr>
<tr>
<td>1116</td>
<td>1122</td>
<td>Break up concrete pad, and remove fragments from wellhead.</td>
</tr>
<tr>
<td>1122</td>
<td>1127</td>
<td>Wrap a cable around the stick-up of the protective casing, and attempt to pull out the well: the well (in entirety) comes out fairly easily. Extract a total of: 1.7 ft of 12-in. outside diameter (OD) PVC surface casing, 6.8 ft of 6 5/8-in. OD steel protective casing, and a 10.4-ft length of stainless steel well assembly which includes 8.5 ft of 2 3/8-in. OD casing and 1.9 ft of 2 3/8-in. screen (with pointed end).</td>
</tr>
</tbody>
</table>
**ACTIVITY/COMMENTS**

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-30-96</td>
<td>1127</td>
<td>Rig up with 12-in. OD, 8 1/4-in. inside diameter (ID) hollow-stem augers; lead flyte is 5.3 ft long, subsequent flytes are 5.0 ft long.</td>
</tr>
<tr>
<td></td>
<td>1130</td>
<td>Commence augering. Ream the wellbore from 0.0 ft to 9.7 ft BGS. Breathing zone analysis (BZA) at 3.2 ft BGS = 0.0 ppm. Cuttings from 0.0 ft to 3.2 ft BGS consist of: dark yellowish-brown (10YR 4/2) to grayish-brown (5YR 3/2), moist, clayey, silty soil with fragments of medium gray (N5) to medium dark gray (N4) cement and concrete. Mercury vapor of cuttings at 4.5 ft BGS = 0.0 mg/m². Cuttings from 3.2 ft to 5.0 ft BGS are: grayish-brown (5YR3/2) to dusky yellowish-brown (10YR 2/2), moist, silty clay with minor cement fragments. BZA at 6.3 ft BGS = 0.0 ppm. Hard drilling at 8.0 ft BGS (a rock fragment). Mercury vapor of cuttings at 8.3 ft BGS = 0.0 mg/m². Hard drilling at 9.4 ft BGS (bottom of borehole). Cuttings from 5.0 ft to 9.7 ft BGS are: dark yellowish-orange (10YR6/6) to moderate yellowish-brown (10YR 5/4) moist clay, with common sand (filter pack).</td>
</tr>
<tr>
<td></td>
<td>1149</td>
<td>Auger refusal at 9.7 ft BGS. Trip out augers. Tag bottom of borehole at 9.6 ft BGS (0.1 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 4.4 cubic ft, equivalent to 6.4 sacks of bentonite aggregate.</td>
</tr>
<tr>
<td></td>
<td>1152</td>
<td>Pour 6, 50-lb sacks of 3/8-in. bentonite aggregate into the borehole. Unhydrated bentonite fills the borehole to 2.7 ft BGS. Add 10 gallons of water to hydrate the bentonite.</td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1233</td>
<td>Clean off augers, and cap remaining borehole with clay soil.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-30-96</td>
<td>1248</td>
<td>Pull the four protective posts out of the ground. Refill the post holes with clay soil.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1336</td>
<td></td>
</tr>
<tr>
<td>1336</td>
<td>1458</td>
<td>Cut up extracted casings and split lengthwise for screening. Collect solid wastes (concrete fragments and casings) and stage adjacent to well site for screening. Clean up site, depart.</td>
</tr>
</tbody>
</table>

P&A of well GW-669 is complete.
### WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT

**LOCATION:** East Fork Poplar Creek  
**OPERATOR:** J. Young - Highland Drilling Co.  
**HELPERS:** G. Shillings/J. Gallaher - Highland Drilling Co.  
**DRILL:** Ingersoll-Rand XL-750

<table>
<thead>
<tr>
<th>DATE</th>
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<th>FINISH</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-2-96</td>
<td>1148</td>
<td>1210</td>
<td>Arrive at GW-670 site. Crew is positioning the drill rig over the well. Begin setting up the site. Uncap the well: organic vapors in casing headspace = 0.0 ppm; mercury vapors in casing headspace = 0.0 mg/m³. Measure water level at 5.1 ft below ground surface (BGS). Tag bottom of well (solid) at 19.8 ft BGS. Note: The Subsurface Data Base (Y-T/S-881/R3) reports the total depth of well GW-670 at 20.0 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 40 cpm.</td>
</tr>
<tr>
<td>1210</td>
<td>1217</td>
<td></td>
<td>S. Jones (HSEA) repeats site-specific briefing for new Highland Drilling Co. personnel.</td>
</tr>
<tr>
<td>1217</td>
<td>1229</td>
<td></td>
<td>Cut off 2.2 ft of the casing stick-up; burn a lifting hole in the remaining stick-up. Raise the mast.</td>
</tr>
<tr>
<td>1229</td>
<td>1338</td>
<td></td>
<td>Begin rigging up with 6-in. outside diameter (OD), 5 1/4-in. inside diameter (ID) washover pipe. Having difficulty threading subadapter to the washover pile. Discover that the subadapter has incompatible threads. Crew leaves to find some arrangement of washover pipe/cutting shoe/subadapter with compatible threads (will likely take the rest of the day). Oversight departs.</td>
</tr>
<tr>
<td>5-3-96</td>
<td>0812</td>
<td>0859</td>
<td>Arrive at GW-670 site. Crew on site with another washover pipe assembly. Start drill rig. Rig up with 9-in. OD, 8-in. ID washover pipe with hard-surface, non-tungsten carbide cutting bit; total length = 22.1 ft, table height = 2.4 ft.</td>
</tr>
</tbody>
</table>
## Activity/Comments

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Activity/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-3-96</td>
<td>0859-0905</td>
<td>Commence overwash of well casing using compressed air only.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>0905-0922</td>
<td>Stop overwash: bit has barely scratched the surface of the pad.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Break up the concrete pad, and remove the fragments. Confirm the presence of surface casing, 11-in. ID steel casing (of unknown depth).</td>
</tr>
<tr>
<td></td>
<td>0922-0930</td>
<td>Continue overwash of well casing using compressed air only.</td>
</tr>
<tr>
<td></td>
<td>0930-0952</td>
<td>Stop overwash again: bit still not cutting. Apparently, concrete fills some of the casing annulus. Rig up on an 8 3/4-in. diameter bit to drill a pilot bore.</td>
</tr>
<tr>
<td></td>
<td>0952-1015</td>
<td>Commence drilling using compressed air only. Drill up casing and concrete/annular cement from 0.0 ft to 0.8 ft BGS. Cuttings consist of dark gray (N3) concrete fragments; very pale orange (10YR8/2) cement/Cal-seal™ fragments; and stainless steel slivers.</td>
</tr>
<tr>
<td></td>
<td>1015-1027</td>
<td>At 0.8 ft BGS, have apparently drilled through the concrete. Rig down the bit, rig the washover pipe back up.</td>
</tr>
<tr>
<td></td>
<td>1027-1112</td>
<td>Connection made, continue overwash of casing. Overwash casing from 0.8 ft to 19.8 ft BGS. Dusty drilling. Breathing zone analysis (BZA) at 1.8 ft BGS = 0.4 ppm (acrid dust). Dust quits at 7.5 ft BGS. Cuttings from 0.8 ft to 7.5 ft BGS consist of the very pale orange (10YR8/2) cement/Cal-seal™ fragments of above. Encounter water at 8.8 ft BGS. BZA at 9.8 ft BGS = 0.0 ppm. BZA at 16.8 ft BGS = 0.0 ppm. Cuttings from 7.5 ft to 19.9 ft BGS consist predominantly of grayish-orange (10YR7/4), fine-grained, quartz sand (filter pack) with minor cement fragments as above.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>5/3/96</td>
<td>1112</td>
<td>At 19.8 ft BGS. Clean out the borehole. Break connection, and trip washer pipe out of the borehole. The well casing and screen are wedged inside the washer pipe. Rig up a 9 7/8-in. diameter bit with a subadapter; length = 6.2 ft, table height = 2.3 ft.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1203</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td>1250</td>
<td>1312</td>
<td>Commence reaming the borehole. Ream from 0.0 ft to 22.9 ft BGS using compressed air only. Water at 5.7 ft BGS. Top of weathered rock at 7.6 ft BGS. BZA at 10.5 ft BGS = 0.0 ppm. Mercury vapors at 13.9 ft BGS = 0.0 mg/m³. BZA at 18.9 ft BGS = 0.0 ppm. Hard drilling at 21.9 ft BGS (bottom of wellbore). Cuttings from 0.0 ft to 22.9 ft BGS are: very pale orange (10YR8/2) to medium light gray (N6) cement fragments; grayish-orange (10YR7/4), fine-grained quartz sand; minor moderate yellowish-brown (10YR5/4) weathered limestone; and dark gray (N3), massive, very finely-cristalline micrite with white to pink calcite veinlets.</td>
</tr>
<tr>
<td>1312</td>
<td>1338</td>
<td>At 22.9 ft BGS. Clean out borehole. Trip out tools. Tag bottom of borehole at 22.9 ft BGS (clean hole). Calculate a borehole volume to 7 ft BGS (estimated bottom of surface casing) of 8.4 cubic ft, equivalent to 7.2 sacks of cement.</td>
</tr>
<tr>
<td>1338</td>
<td>1442</td>
<td>Crew departs for grouting supplies/equipment.</td>
</tr>
<tr>
<td>1442</td>
<td>1452</td>
<td>Crew returns, run 1.5-in. OD PVC tremie pipe into the borehole to 19.0 ft BGS.</td>
</tr>
<tr>
<td>1452</td>
<td>1536</td>
<td>Mix and pump-tremie 7 sacks (8.3 cubic ft) of neat, Type I Portland cement (grout weight = 12.6 lbs./gal) into the borehole. Circulate water.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>------------</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>5-3-96</td>
<td>1536</td>
<td>Pull out tremie pipe. Clean up. Secure site, and depart.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-6-96</td>
<td>0806</td>
<td>Arrive at GW-670 site. Tag cement level inside of surface casing at 5.2 ft BGS. Driller arrives. Crew is at the pipeyard collecting the washover pipe for overwashing the surface casing.</td>
</tr>
<tr>
<td></td>
<td>0949</td>
<td>Crew arrives; steam cleans the &quot;big&quot; washover pipe, and the hole opener. Washover pipe cutting shoe is 13 1/4-in. OD, 12-in. ID. Thread pieces together and rig up. Total length of tools = 13.4 ft, table height = 2.3 ft.</td>
</tr>
<tr>
<td></td>
<td>1055</td>
<td>Commence overwash. Overwash surface casing from 0.0 ft to 8.0 ft BGS using compressed air only. Dusty drilling. BZA at 1.5 ft BGS = 0.0 ppm. Dust diminishes at 6.5 ft BGS. BZA at 7.5 ft BGS = 0.0 ppm. Encounter water at 8.0 ft BGS. Cuttings from 0.0 ft to 8.0 ft BGS consist of: brownish-gray (5YR4/1) cement fragments; metal slivers and wires; and rare, dark yellowish-orange (10YR6/6) clay.</td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td>At 8.0 ft BGS. Trip out washover pipe, surface casing is loose in the borehole. Attach a jawed clamp to the casing and pull out. Extract 7.3 ft of 11-in. ID steel casing. Break subadapter loose and rig down the washover pipe. Rig up a 16-in. diameter hole opener on a subadapter; length to reaming cones = 6.7 ft, total length = 8.2 ft, table height = 2.4 ft.</td>
</tr>
<tr>
<td></td>
<td>1240</td>
<td>Commence reaming cased portion of the hole. Ream from 0.0 ft to 8.3 ft using compressed air only. Mercury vapors at 5.3 ft BGS = 0.0 mg/m³. BZA at 6.7 ft BGS = 0.2 ppm. Cuttings from 0.0 ft to 8.3 ft BGS consist of: dark yellowish-orange (10YR6/6), moist clay; and brownish-gray (5YR4/1) to medium, dark gray (N4) to greenish-black (5GY2/1) cement fragments.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>---------</td>
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<td>-------------------</td>
</tr>
<tr>
<td>5-6-96</td>
<td>1252</td>
<td>1345 At 8.3 ft BGS. Clean out borehole. Trip out tools. Tag bottom of borehole at 8.3 ft BGS (clean hole). Calculate a borehole volume to 4.0 ft BGS of 6.0 cubic ft, equivalent to 5.1 sacks of cement. Secure rods in the carousel. Lower the mast.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1345</td>
<td>1437</td>
<td>Crew goes for lunch, and to get grouting supplies.</td>
</tr>
<tr>
<td>1437</td>
<td>1454</td>
<td>Crew returns. Mix and pour 5 sacks (5.9 cubic ft) of neat, Type I Portland cement (grout weight = 14.3 lbs/gal) directly into the borehole. Liquid grout/water level is at 2.0 ft BGS.</td>
</tr>
<tr>
<td>1454</td>
<td>1535</td>
<td>An unexpected close lightning strike chases crew and oversight into trucks to wait out the storm. Up to this time no lightning had been observed. Heavy rains begin to fall after personnel got into vehicles.</td>
</tr>
<tr>
<td>1535</td>
<td>1557</td>
<td>While storm conditions continue, with lightning still close by, oversight suspends operations for the day. Clean up. Secure site, and depart.</td>
</tr>
<tr>
<td>5-7-96</td>
<td>-0717</td>
<td>0755 Arrive at GW-670 site. Tag cement level at 3.6 ft BGS. Borehole is ready to be capped. G. Shillings (Highland) begins steam cleaning the drill rig.</td>
</tr>
<tr>
<td></td>
<td>0755</td>
<td>0839 G. Shillings departs to get torches.</td>
</tr>
<tr>
<td></td>
<td>0839</td>
<td>1042 G. Shillings returns, begins cutting up extracted casings to be scanned. Cap remaining borehole with clay soil. P&amp;A of well GW-670 is complete. Oversight acting as fire-watch during cutting operations. Depart site.</td>
</tr>
</tbody>
</table>
**Y-12 PLANT GROUNDWATER PROTECTION PROGRAM**

**WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT**

**LOCATION:** East Fork Poplar Creek  
**DATE:** START: 5-7-96  
**OPERATOR:** D. Key - Highland Drilling Co.  
**FINISH: 5-7-96**  
**HELPERS:** G. Shillings/J. Gallaher - Highland Drilling Co.  
**METHOD:** A  
**DRILL:** Ford 555B Backhoe with McMillan Diggerhead Auger Motor  
**LOGGED BY:** Timothy Coffey - SAIC

<table>
<thead>
<tr>
<th>DATE</th>
<th>START</th>
<th>FINISH</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-7-96</td>
<td>1250</td>
<td>1255</td>
<td>Arrive at GW-671 site. Uncap well: organic vapors in casing headspace = 0.0 ppm.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>mercury vapors in casing headspace = 0.0 mg/m³. Measure water level at 2.2 ft</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>below ground surface (BGS). Tag bottom of well (solid) at 7.5 ft BGS. Note: The</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Subsurface Data Base (Y/TS-881/R3) reports the total depth of the well to be</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>7.6 ft. Background radiological scan of the location: alpha = NA (wet), beta/gamma=60-79 cpm.</td>
</tr>
<tr>
<td>1255</td>
<td>1258</td>
<td></td>
<td>Attempt to break up the concrete pad: the pad won't break.</td>
</tr>
<tr>
<td>1258</td>
<td>1306</td>
<td></td>
<td>Wrap a chain around the protective casing stick-up, and pull out the well</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>assembly, the protective casing, and pad in one piece.</td>
</tr>
<tr>
<td>1306</td>
<td>1325</td>
<td></td>
<td>Extract 4.8 ft of 6 5/8-in. outside diameter (OD) steel casing plus a 10.0 ft,</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>2 3/8-in. OD stainless steel well assembly (which includes a 2.9-ft screen</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>section and 7.1 ft of casing).</td>
</tr>
<tr>
<td>1325</td>
<td>1335</td>
<td></td>
<td>Commence augering. Ream the wellbore from 0.0 ft to 8.8 ft BGS. Mercury</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>vapors at 2.3 ft BGS = 0.0 mg/m³. Moisture at 3.5 ft BGS (clay begins to ball-up).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Breathing zone analysis (BZA) at 6.5 ft BGS = 0.1 ppm. Water at 7.0 ft BGS.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mercury vapors at 7.5 ft BGS = 0.0 mg/m³. Cuttings from 0.0 ft to 8.8 ft BGS.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BGS are: grayish-brown (5YR3/2) to dark yellowish-brown.</td>
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<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
<td></td>
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<td>----------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>5-7-96 (cont.)</td>
<td></td>
<td>(10YR4/2), moist to wet, silty clay with minor cement fragments.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moisture content of cuttings increases with depth.</td>
<td></td>
</tr>
<tr>
<td>1335</td>
<td>1344</td>
<td>Auger refusal at 8.8 ft BGS. Trip out augers. Tag bottom of borehole at 8.7 ft BGS (0.1 ft of fill). Water is quickly filling the borehole. Calculate a borehole volume to 4.0 ft BGS of 3.7 cubic ft, equivalent to 5.4 sacks of bentonite aggregate.</td>
<td></td>
</tr>
<tr>
<td>1344</td>
<td>1350</td>
<td>Pour 6, 50-lb. sacks of 3/8-in. bentonite aggregate into the borehole. Unhydrated bentonite level at 3.4 ft BGS.</td>
<td></td>
</tr>
<tr>
<td>1350</td>
<td>1400</td>
<td>Remove auger motor from backhoe boom, replace with bucket.</td>
<td></td>
</tr>
<tr>
<td>1400</td>
<td>1410</td>
<td>Clean up site. Cap remaining borehole with clay soil. Load equipment and solid wastes (casing/screen sections, concrete fragments) onto backhoe, and depart site.</td>
<td></td>
</tr>
</tbody>
</table>

P&A of well GW-671 is complete.
**Y-12 PLANT GROUNDWATER PROTECTION PROGRAM**

**WELL NO.** GW-672

**WELL PLUGGING AND ABANDONMENT**

**ACTIVITY/PROGRESS REPORT**

<table>
<thead>
<tr>
<th>LOCATION:</th>
<th>Ash Disposal Basin</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE: START:</td>
<td>7-16-96</td>
</tr>
<tr>
<td>FOREMAN:</td>
<td>G. Shillings - Highland Drilling Co.</td>
</tr>
<tr>
<td>HELPERS:</td>
<td>D. Williford, H. Hall, J. Gallaher</td>
</tr>
<tr>
<td>DRILL:</td>
<td>NA</td>
</tr>
<tr>
<td>METHOD:</td>
<td>A</td>
</tr>
<tr>
<td>LOGGED BY:</td>
<td>Timothy Coffey - SAIC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-16-96</td>
<td>1000 1014</td>
<td>Arrive at GW-672 site. Uncap the well; organic vapors in casing headspace = 0.0 ppm. Measure water level at 23.7 ft below ground surface (BGS). Tag bottom of the well (solid) at 28.3 ft BGS. Note: The Subsurface Data Base (YTS-881/R3) reports the total depth of well GW-672 to be 28.0 ft. Due to the proximity of the well directly uphill of a wetlands area, and personnel health and safety concerns, HSEA has granted a deviation from the plugging and abandonment procedure. This well will be grouted with casing remaining in the borehole.</td>
</tr>
<tr>
<td>1014</td>
<td>1020</td>
<td>Slowly pour 2.50-lb sacks of 3/8-in. bentonite aggregate into the well. Unhydrated bentonite level is at 13.1 ft BGS. Bentonite to hydrate approximately 4 hours. Depart site.</td>
</tr>
<tr>
<td>1405</td>
<td>1442</td>
<td>Return to GW-672 site. Tag hydrated bentonite level at 13.1 ft BGS (no change, bentonite extended far above the water level). Calculate a casing volume of 1.5 cubic ft, equivalent to 1.3 sacks of Type I cement.</td>
</tr>
<tr>
<td>1442</td>
<td>1500</td>
<td>Mix and pump approximately 2 sacks (2.4 cubic ft) of neat, Type I Portland cement (grout weight = 12.2 lbs/gal) into the well casing. Liquid cement fills the casing to the top. Depart site.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
</tr>
<tr>
<td>--------</td>
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<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>7-17-96</td>
<td>0857</td>
<td>At GW-672 site. The cement grout in the well has hardened, and remains even with</td>
</tr>
<tr>
<td></td>
<td>0902</td>
<td>top of the casing. Plan to cut off casing tomorrow. Depart site.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-18-96</td>
<td>0746</td>
<td>At GW-672 site. Crew breaks up the concrete pad and removes the fragments from the</td>
</tr>
<tr>
<td></td>
<td>0823</td>
<td>wellhead. No evidence of surface casing below pad. Oversight departs.</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>1500</td>
<td>Oversight returns to GW-672 site. Crew has cut off well casing and protective</td>
</tr>
<tr>
<td></td>
<td>1510</td>
<td>casing flush with the ground surface.</td>
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<tr>
<td></td>
<td></td>
<td>P&amp;A of GW-672 is complete.</td>
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<td></td>
<td></td>
<td>Note: No intrusive work was performed in the decommissioning of this well, hence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>no Cuttings Field Screening/Disposal Sheet or Equipment Decontamination Summary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>was required.</td>
</tr>
</tbody>
</table>
**Y-12 PLANT GROUNDWATER PROTECTION PROGRAM**

**WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT**

**WELL NO.** GW-721

**LOCATION:** Water Treatment Plant (East Pine Ridge)

**OPERATOR:** G. Shillings - Highland Drilling Co.

**HELPER:** H. Hall - Highland Drilling Co.

**DRILL:** Ford 455 Backhoe

**DATE:** START: 9-18-95

**FINISH:** 9-19-95

**METHOD:** C

**LOGGED BY:** Timothy Coffey - SAIC

<table>
<thead>
<tr>
<th>DATE</th>
<th>START</th>
<th>FINISH</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-18-95</td>
<td>1400</td>
<td>1414</td>
<td>Arrive at GW-721 site. The wellhead is open and consists of 12 3/4-in. outside diameter (OD) PVC casing. Casing stick-up = 1.5 ft. Measure water level at 4.3 ft below ground surface (BGS). Tag bottom of well (soft) at 5.5 ft BGS. Note: the Subsurface Data Base (Y/TS-881/R2) reports the total depth of well GW-721 to be 6.0 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 60-90 cpm. Move backhoe onto location.</td>
</tr>
<tr>
<td>1414</td>
<td>1439</td>
<td></td>
<td>Attach a jawed clamp to the casing, and pull it out fairly easily. Extract 4.5 ft of 12 3/4-in. OD PVC casing and 2.5 ft of 12 3/4-in. OD PVC screen (a total of 7.0 ft of well materials recovered from the well). The original well annulus had been back-filled with bentonite (the Subsurface Data Base reports the original wellbore to be 22-in. diameter). Tag bottom of borehole at 4.5 ft BGS. Calculate a borehole volume to 1.0 ft BGS of 3.1 cubic ft, equivalent to 4.5 sacks of Shur-Plug™ bentonite aggregate. Move backhoe off site.</td>
</tr>
<tr>
<td>1439</td>
<td>1528</td>
<td></td>
<td>Crew departs to get Shur-Plug™ bentonite. Beta/gamma scan of extracted casing/screen = 50 cpm.</td>
</tr>
<tr>
<td>1528</td>
<td>1537</td>
<td></td>
<td>Crew returns to GW-721 site. Pour 4, 50-lb sacks of 3/8-in. bentonite aggregate into the borehole unhydrated bentonite level at 1.3 ft BGS. Add 20 gallons of potable water to hydrate the bentonite. Secure site and depart.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>9-19-95</td>
<td>0921</td>
<td>Start of activity at GW-721 site. Tag hydrated bentonite at 1.2 ft BGS (bentonite swelled 0.1 ft). Cap remaining borehole with clay soil.</td>
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</tr>
<tr>
<td></td>
<td>0923</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>P&amp;A of well GW-721 is complete.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: No intrusive work was performed in the P&amp;A of this well, hence no Cuttings Field Screening/Disposal Sheet or Equipment Decontamination Summary was required.</td>
<td></td>
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<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>8-30-95</td>
<td>0820</td>
<td>Arrive at LL/HAZ-06 site. The drill rig is on the location. Uncap well: organic vapors in casing headspace = 0.0 ppm. Measure water level at 16.2 ft below ground surface (BGS). Tag bottom of well (solid) at 27.7 ft BGS. Note: While preparing the location for the drill rig, the crew had to remove the concrete pad and excavate approximately 2 ft of soil to obtain a level site on which to set up drill rig. The Subsurface Data Base (YTS-881/R2) reports the depth of well LL/HAZ-06 to be 30.0 ft. Assume present tagged depth of 27.7 ft to be the same as 30.0 ft (pre-P&amp;A). Target depth for wellbore reaming will be approximately 1 ft beyond the 27.7 ft tagged depth. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 70 cpm. Cut off 1.9 ft of the 6 5/8-in. outside diameter (OD) PVC casing stick-up.</td>
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<tr>
<td>0851</td>
<td>0902</td>
<td>Position drill rig over the well, and raise the mast.</td>
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<tr>
<td>0902</td>
<td>0938</td>
<td>Attach a jawed clamp to the casing collar, and attempt to pull out the casing; casing comes out of the ground a little, but breaks. Attempt to pull out casing using a chain wrapped around the casing, then with a canvas strap: both slip off after pulling casing out a little more.</td>
<td></td>
</tr>
<tr>
<td>0938</td>
<td>0948</td>
<td>Cut off another 3.6 ft of 6 5/8-in. OD PVC casing. Rig up with an 8 3/4-in. diameter tricone bit on a subadapter; total length = 4.3 ft, table height = 2.2 ft.</td>
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<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>8-30-95</td>
<td>0948</td>
<td>Commence drilling up casing/reaming wellbore using compressed air only. Drill/ream from 0.0 ft to 29.1 ft BGS (1.4 ft beyond tagged well TD). Cuttings from 0.0 ft to 1.0 ft BGS are: grayish-orange (10 YR 7/4), dry clay. Begin to see sand (filter pack) in returns at 3.0 ft BGS. Encounter weathered rock at 8.0 ft BGS. Cuttings from 1.0 ft to 8.0 ft BGS are: light brown (5 YR 5/6) to moderate brown (5 YR 4/4), moist clay/ extremely weathered shale (relict bedding visible); white (N9) PVC fragments; and medium-grained, angular quartz sand. Breathing zone analysis (BZA) at 12.0 ft BGS = 0.0 ppm. Encounter moisture, then water at 14.5 ft BGS. BZA at 19.1 ft and 25.1 ft BGS both read 0.0 ppm. Cuttings from 8.0 ft to 29.1 ft BGS consist of light olive gray (5 YR 5/2), pale brown (5 YR 4/2), and dark yellowish-brown (10 YR 4/2), weathered and stained, thinly laminated shale; Quartz sand; and white (N9) PVC fragments. Beta/gamma scan of cuttings range 60-70 cpm for the entire interval.</td>
<td></td>
</tr>
<tr>
<td>1024</td>
<td>1058</td>
<td>At 29.1 ft BGS. Clean out borehole. Trip out tools. Tag bottom of borehole at 28.2 ft BGS (0.9 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 10.2 cubic ft, equivalent to 8.6 sacks of Type I cement. Secure rods in carousel, lower mast, and move drill rig off the location.</td>
<td></td>
</tr>
<tr>
<td>1058</td>
<td>1135</td>
<td>Mix and gravity-tremie 9 sacks (10.6 cubic ft) of neat, Type I Portland cement (grout weight of 13.9 lbs/gal.) into the borehole. Liquid cement fills the borehole to the ground surface.</td>
<td></td>
</tr>
<tr>
<td>1135</td>
<td>1220</td>
<td>Clean up, secure site, and depart.</td>
<td></td>
</tr>
<tr>
<td>8-31-95</td>
<td>0832</td>
<td>At LL/HAZ-06 site. Tag cement level at 3.6 ft BGS. Cap remaining borehole with clay soil.</td>
<td></td>
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<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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</tr>
<tr>
<td>8-31-95</td>
<td></td>
<td>P&amp;A of well LL/HAZ-06 is complete.</td>
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<td>(cont.)</td>
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</tr>
</tbody>
</table>
## WELL PLUGGING AND ABANDONMENT
### ACTIVITY/PROGRESS REPORT

**LOCATION:** Gum Branch Road Area

**DRILLER:** R. Phillips - Highland Drilling Co.

**HELPERS:** H. Hall - Highland Drilling Co.

**DRILL:** Ingersoll-Rand XL-750

**DATE:** START: 2-21-96  
**FINISH:** 3-4-96

**METHOD:** C

**LOGGED BY:** Timothy Coffey - SAIC

### ACTIVITY/COMMENTS

<table>
<thead>
<tr>
<th>DATE</th>
<th>START TIME</th>
<th>FINISH TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-21-96</td>
<td>1440</td>
<td>1518</td>
<td>Move drill rig onto LL/HAZ-11 site and position over the well. Set up the site. Uncap the well: organic vapors = 0.8 ppm. Measure the water level in well at 8.8 ft below ground surface (BGS). Tag bottom of the well (soft) at 32.6 ft BGS. Note: the Subsurface Data Base (YTS-881/R3) reports the total depth of well LL/HAZ-11 to be 33.0 ft. Background radiological scan of the location: alpha = 0 cpm, beta/gamma = 60-80 cpm.</td>
</tr>
<tr>
<td>1518</td>
<td>1610</td>
<td></td>
<td>Raise the mast. Attach a jawed clamp to the casing, and attempt to pull out; casing comes out approximately 0.3 ft then breaks. Repeated attempts fail to pull the casing any further. Plan to drill up the casing tomorrow. Depart site.</td>
</tr>
<tr>
<td>2-22-96</td>
<td>0840</td>
<td>0855</td>
<td>Arrive at LL/HAZ-11 site. Crew starts drill rig carrier. Checking drive train (heard &quot;funny&quot; noise in rear end of drill rig when moving onto side yesterday). Crew is uncertain as to the source of the noise, but it may have been a broken axle.</td>
</tr>
<tr>
<td>0855</td>
<td>0916</td>
<td></td>
<td>Start drill rig. Add a 25-ft rod to the drill head. Rig up with a 7 7/8-in. diameter bit on a subadapter; length = 1.9 ft, table height = 2.5 ft.</td>
</tr>
<tr>
<td>0916</td>
<td>0948</td>
<td></td>
<td>Commence drilling up the PVC well casing while reaming the wellbore. Drill/ream from 0.0 to 1.0 ft BGS using compressed air only. Cuttings from 0.0 ft to 0.5 ft are medium light gray (N6) concrete and white (N9) PVC fragments. Cuttings from 0.5 ft to</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<td></td>
</tr>
<tr>
<td>2-22-96</td>
<td>0916</td>
<td>0948</td>
<td></td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td>1.0 ft BGS consist of dark yellowish-brown (10YR 4/2), moist, clayey soil.</td>
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<td></td>
<td>0948</td>
<td>0957</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>At 1.0 ft BGS, the concrete pad is loose. Pry up pad, and remove from wellhead.</td>
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<tr>
<td></td>
<td>0957</td>
<td>1022</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Attach the jawed clamp to the casing and again attempt to pull out; the casing again comes out approximately 0.2 ft and stops.</td>
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<tr>
<td></td>
<td>1022</td>
<td>1048</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continue drilling casing while reaming the wellbore. Drill/ream from 1.0 ft to 21.4 ft BGS. Breathing zone analysis (BZA) at 4.4 ft BGS = 0.0 ppm. Begin to see sand in returns at 5.0 ft BGS. Top of weathered rock at 5.0 ft BGS. Cuttings from 1.0 ft to 5.0 ft BGS consist of dark yellowish-brown (10YR 4/2) to moderate brown (5YR 4/4), moist, clayey soil; and white (N9) PVC fragments. Encounter water at 7.0 ft BGS. BZA at 10.6 ft BGS - 0.0 ppm. Borehole making water by 14.0 ft BGS. Cuttings from 5.0 ft to 21.4 ft BGS are pale olive (10YR 6/2), dark yellowish-orange (10YR 6/6), and pale brown (5YR 5/2), weathered, thinly laminated shale; and abundant angular, fine- to medium-grained quartz sand.</td>
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<td></td>
<td>1048</td>
<td>1057</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>At 21.4 ft BGS. Trip out tools.</td>
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<tr>
<td></td>
<td>1057</td>
<td>1112</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crew departs for a piece of conductor casing to keep the borehole collar open.</td>
<td></td>
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<tr>
<td></td>
<td>1112</td>
<td>1120</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crew returns with a 4-ft section of 10 3/4-in. outside diameter (OD), 10-in. inside diameter (ID) steel casing. Push the casing into the ground, leaving a 0.2 ft stick-up.</td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
<td></td>
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<tr>
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<td>-------------------------------------------------------------</td>
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</tr>
<tr>
<td>2-22-96</td>
<td>1120</td>
<td>Remove the 7 7/8-in. bit, and replace with an 8 1/2-in. diameter bit; length of new bit and subadapter = 2.0 ft, table height remains at 2.5 ft.</td>
<td></td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1151</td>
<td>1221</td>
<td>Trip back into borehole, reaming with the new bit. No cuttings returned from 0.0 ft to 12.5 ft BGS. Continue drilling casing/reaming wellbore to 34.3 ft BGS using compressed air only. BZA at 23.2 ft BGS = 0.0 ppm. BZA at 29.8 ft BGS = 0.2 ppm. Some very hard drilling occurrences in this interval. Cuttings from 12.5 ft to 34.3 ft BGS are generally moderate brown (5 YR 4/4) to light olive gray (5Y 5/2), weathered shale; grayish-brown (5YR 3/2) weathered micrite; quartz sand; and PVC fragments.</td>
<td></td>
</tr>
<tr>
<td>1221</td>
<td>1225</td>
<td>At 34.3 ft BGS. Clean out borehole. Trip out 10 ft.</td>
<td></td>
</tr>
<tr>
<td>1225</td>
<td>1305</td>
<td>Break for lunch.</td>
<td></td>
</tr>
<tr>
<td>1305</td>
<td>1321</td>
<td>Rig back on. Clean out borehole using water that had accumulated in the hole. Trip out tools, remove bit/subadapter assembly. Tag bottom of borehole at 34.3 ft BGS (borehole is clean). Calculate a borehole volume to 4.0 ft BGS of 11.9 cubic ft, equivalent to 10.1 sacks of Type I cement.</td>
<td></td>
</tr>
<tr>
<td>1321</td>
<td>1430</td>
<td>Secure rods in carousel and lower mast. Screen cuttings composite. Highland Drilling Co. mechanic on site to examine drill rig drive train. Oversight departs.</td>
<td></td>
</tr>
<tr>
<td>2-23-96</td>
<td>0900</td>
<td>Arrive at LL/HAZ-11 site. Move grouting equipment to site. Run 1.5-in. OD PVC tremie pipe into the borehole to 29.0 ft BGS.</td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
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<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>2-23-96</td>
<td>0922</td>
<td>Mix and pump-tremie 11 sacks (13.0 cubic ft) of neat Type I Portland cement (average grout weight = 12.7 lbs/gal) into the borehole. Circulate water, then 50% cement.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1018</td>
<td>Pull out tremie pipe. Clean up. Secure site and depart.</td>
<td></td>
</tr>
<tr>
<td>3-1-96</td>
<td>0808</td>
<td>At LL/HAZ-11 site. Tag cement level at 6.3 ft BGS. Calculate a borehole volume of 4.0 ft BGS of 0.9 cubic ft, equivalent to 0.8 sacks of Type I cement. Pull out conductor casing by hand.</td>
<td></td>
</tr>
<tr>
<td>0817</td>
<td>0824</td>
<td>Mix and pour 2 sacks (2.4 cubic ft) of neat Type I Portland cement directly into the borehole. Liquid cement fills the borehole to 0.5 ft BGS.</td>
<td></td>
</tr>
<tr>
<td>0824</td>
<td>0830</td>
<td>Depart site.</td>
<td></td>
</tr>
<tr>
<td>3-4-96</td>
<td>0832</td>
<td>At LL/HAZ-11 site. Tag cement level at 1.3 ft BGS. Cap remaining borehole to ground surface with clay soil. Depart.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0838</td>
<td>P&amp;A of well LL/HAZ-11 is complete.</td>
<td></td>
</tr>
</tbody>
</table>
## Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

### WELL PLUGGING AND ABANDONMENT

#### ACTIVITY/PROGRESS REPORT

| LOCATION: Gum Branch Road Area | DATE: START: | 8-31-95 |
| DRILLER: H. Hall - Highland Drilling Co. | FINISH: | 9-5-95 |
| HELPERS: R. Phillips/J. Gallaher - Highland Drilling Co. | METHOD: | C |
| DRILL: Ingersoll-Rand XL-750 | LOGGED BY: | Timothy Coffey - SAIC |

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-31-95</td>
<td>0843</td>
<td>Start</td>
</tr>
<tr>
<td>0925</td>
<td>Break up concrete pad and remove the fragments.</td>
<td></td>
</tr>
<tr>
<td>0925</td>
<td>0953</td>
<td>Break up concrete pad and remove the fragments.</td>
</tr>
<tr>
<td>0953</td>
<td>1015</td>
<td>Raise the mast. Attempt to pull out the casing using a jawed clamp, then a canvas strap both are unsuccessful as the casing does not budge. Cut off 1.6 ft of the casing stick-up.</td>
</tr>
<tr>
<td>1015</td>
<td>1019</td>
<td>Rig up with an 8 3/4-in. diameter tricone bit on a subadapter; total length = 4.3 ft, table height = 3.0 ft.</td>
</tr>
<tr>
<td>1019</td>
<td>1103</td>
<td>Commence drilling up the casing/reaming the wellbore using compressed air only. Drill/ream from 0.0 ft to 36.3 ft BGS. Encounter weathered rock at 1.0 ft BGS. Cuttings from 0.0 ft to 1.0 ft BGS are grayish-orange (10YR 7/4), dry, clay (topsoil). Breathing zone analysis (BZA) at 4.0 ft BGS = 0.0 ppm. BZA at 14.5 ft BGS = 0.0 ppm. Encounter moisture at 20.3 ft BGS, then water at 21.3 ft BGS. BZA at 22.3 ft BGS = 0.0 ppm. Encounter fresh rock at 35.3 ft BGS (at bottom of original wellbore). Cuttings from 1.0 ft to 35.3 ft BGS consist of light olive gray (5Y 5/2) to</td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

96-001MS(A)/011096

A-99
### Activity/Comments

#### 8-31-95 (cont.)

- moderate yellowish-brown (10YR 5/4), weathered and stained, thinly laminated shale; dark yellowish-brown (10YR 4/2) to dusky yellowish-brown (10YR 2/2), weathered micrite; fine- to medium-grained quartz sand (filter pack); and white (N9) PVC fragments. Cuttings from 35.3 ft to 36.3 ft BGS are medium dark gray (N4) and blackish-red (5R 2/2), thinly laminated shale; and medium light gray (N6), massive, very finely crystalline micrite. Beta/gamma scan of cuttings range from 50 to 70 cpm for the entire interval.

#### 1103 - 1132

- At 36.3 ft BGS. Clean out borehole. Trip out tools. Tag bottom of borehole at 27.5 ft BGS (8.8 ft of fill). Move water truck to location. Plan to clean borehole again using water to flush cuttings.

#### 1132 - 1218

- Break for lunch.

#### 1218 - 1245

- Trip tools back into bottom of borehole. Use compressed air and water to clean borehole.

#### 1245 - 1316

- Trip out tools. Tag bottom of borehole at 31.0 ft BGS (5.3 ft of fill; unable to clean borehole any better). Calculate a borehole volume to 4.0 ft BGS of 11.3 cubic ft, equivalent to 9.6 sacks of Type I cement. Secure rods in carousel, lower mast, and move drill rig off location.

#### 1316 - 1352

- Mix and gravity-tremie 11 sacks (13.0 cubic ft) of neat, Type I Portland cement (average grout weight of 12.9 lbs/gal) into the borehole. Liquid grout fills the borehole to approximately 3 ft BGS.

#### 1352 - 1400

- Clean up, secure site, and depart.
<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-1-95</td>
<td>0820</td>
<td>Arrive at LL/HAZ-12 site. Tag cement level at 15.2 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>0851</td>
<td>Calculate a borehole volume to 4.0 ft BGS of 4.7 cubic ft. Equivalent to 4.0 sacks of Type I cement.</td>
</tr>
<tr>
<td></td>
<td>0851</td>
<td>Mix and gravity-tremie 5 sacks (5.9 cubic ft) of neat, Type I Portland cement (grout weight of 12.8 lbs/gal) into the borehole.</td>
</tr>
<tr>
<td></td>
<td>0912</td>
<td>Liquid grout fills the borehole to the ground surface.</td>
</tr>
<tr>
<td></td>
<td>0922</td>
<td>Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>9-5-95</td>
<td>0851</td>
<td>At LL/HAZ-12 site. Tag cement level at 3.0 ft BGS. Cap remaining borehole with clay soil.</td>
</tr>
<tr>
<td></td>
<td>0856</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P&amp;A of well LL/HAZ-12 is complete.</td>
</tr>
</tbody>
</table>
### Location: Gum Branch Road Area

**Driller:** H. Hall - Highland Drilling Co.

**Helpers:** R. Phillips - Highland Drilling Co.

**Drill:** Ingersoll Rand XL-750

**Date: Start:** 2-15-96

**Finish:** 3-1-96

**Method:** C

**Logged By:** Timothy Coffey - SAIC

<table>
<thead>
<tr>
<th>Date</th>
<th>Time Start</th>
<th>Time Finish</th>
<th>Activity/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-15-96</td>
<td>0925</td>
<td>0942</td>
<td>Arrive at Gum Branch Road Area, waiting for drill bit to be brought to location.</td>
</tr>
<tr>
<td></td>
<td>0942</td>
<td>0955</td>
<td>D. Key (Highland) brings a 6 3/4-in. diameter tricone bit to location; steam clean the bit.</td>
</tr>
<tr>
<td></td>
<td>0955</td>
<td>1014</td>
<td>At LL/HAZ-14 site. The drill rig is on site, positioned over the well. The crew has already cut off 1.6 ft of the 6 5/8-in. outside diameter (OD) steel protective casing. Uncap well: organic vapors in casing headspace = 31 ppm. Measure water level in well at 38.6 ft below ground surface (BGS). Unable to tag bottom of well; weighted tape is too short. Try with water level indicator but probe is too light to give conclusive measurement. The Subsurface Data Base (Y/TS-881/R3) reports the total depth of well LL/HAZ-14 to be 349.0 ft.</td>
</tr>
<tr>
<td></td>
<td>1014</td>
<td>1026</td>
<td>Start drill rig. Raise the mast. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 70 cpm. The drill rig is not perfectly centered over the well.</td>
</tr>
<tr>
<td></td>
<td>1026</td>
<td>1046</td>
<td>Lower the mast, and &quot;walk&quot; the rig sideways to center over the well. Raise the mast again.</td>
</tr>
<tr>
<td></td>
<td>1046</td>
<td>1102</td>
<td>Burn lifting holes in the protective casing. Attempt to pull out protective casing; casing comes out easily with concrete pad attached. Recover another 1.5 ft of 6 5/8-in. OD steel casing (total...</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2-15-96</td>
<td></td>
<td>Of 3.1 ft recovered. PVC well casing broke off, recover 2.9 ft of 2 3/8-in. OD PVC casing.</td>
<td></td>
</tr>
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<td>(cont.)</td>
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</tr>
<tr>
<td>1102</td>
<td>1121</td>
<td>Add a 25-ft drill rod to the drillhead; thread the 6 3/4-in. diameter bit onto the rod. Length of the bit is 0.6 ft, table height = 2.3 ft.</td>
<td></td>
</tr>
<tr>
<td>1121</td>
<td>1135</td>
<td>Commence drilling up the well casing while reaming the well bore. Drill/ream from 0.0 ft to 5.3 ft BGS using compressed air only. Breathing zone analysis (BZA) at 4.0 ft BGS = 5.4 ppm (maximum). 0.6 ppm (sustained). Cuttings from 0.0 ft to 5.3 ft are white (N9) PVC fragments; and moderate brown (5YR 4/4), moist clayey soil.</td>
<td></td>
</tr>
<tr>
<td>1135</td>
<td>1143</td>
<td>At 5.3 ft BGS, wellbore is deviating out from under the bit. Trip out tools. Tilt the rig so that the bit will follow the wellbore.</td>
<td></td>
</tr>
<tr>
<td>1143</td>
<td>1200</td>
<td>Adjustments are complete, continue drilling casing/reaming wellbore. Drill/ream from 5.3 ft to 9.6 ft BGS using compressed air only. BZA at 7.5 ft BGS = 0.0 ppm. Cuttings from 5.3 ft to 7.5 ft BGS are a continuation of the 0.0-ft to 5.3-ft interval. Cuttings from 7.5 ft to 9.6 ft BGS consist predominantly of dark yellowish-orange (10YR 6/6), moist clay with occasional fragments of pale olive (10Y 6/2) weathered shale.</td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>1233</td>
<td>At 9.6 ft BGS, bit is off the wellbore again. Shut off drill rig. Break for lunch.</td>
<td></td>
</tr>
<tr>
<td>1233</td>
<td>1250</td>
<td>Secure rig carousel, lower mast again, and center rig over well again. Raise mast, table height remains at 2.3 ft.</td>
<td></td>
</tr>
<tr>
<td>1250</td>
<td>1310</td>
<td>Re-drill borehole from 0.0 ft to 9.6 ft BGS.</td>
<td></td>
</tr>
<tr>
<td>1310</td>
<td>1344</td>
<td>Shut off drill rig to repair a leaking &quot;O&quot; ring in the drill head. Leak...</td>
<td></td>
</tr>
</tbody>
</table>
### ACTIVITY/PROGRESS REPORT - continued

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-15-96</td>
<td>10:00</td>
<td>amounted to a few drops of hydraulic fluid on the drill head and table; fluid wiped up.</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1344</td>
<td>14:04</td>
<td>Push in a 3.5-ft section of 8-in. inside diameter (ID) steel conductor casing (to dry and keep the bit centered over the well).</td>
</tr>
<tr>
<td>14:04</td>
<td>14:21</td>
<td>Continue drilling casing/reaming wellbore. Drill/ream from 9.6 ft to 23.3 ft BGS using compressed air only. Encounter water at 13.0 ft BGS. BZA at 14.3 ft BGS = 0.7 ppm (sweet-pungent, aromatic odor noted). More moisture at 16.3 ft BGS. Top of weathered rock at 18.3 ft BGS. Cuttings from 9.6 ft to 18.3 ft BGS are predominantly moderate brown (5YR 4/4), moist clay soil with medium gray (N5) to grayish-orange (5YR 7/2) cement fragments plus occasional weathered shale fragments as noted above. Lower explosive limit (LEL) reading at 19.5 ft BGS &lt; 1% (2.7 ppm). Encounter additional moisture at 22.3 ft and 23.0 ft BGS. Cuttings from 18.3 ft to 23.3 ft BGS are moderate olive brown (5Y 4/4), light olive gray (5Y 5/2), and greenish-gray (5GY 6/1) weathered shale and grayish-orange (10YR 7/4) to moderate yellowish-brown (10YR 5/4), thinly bedded, banded, fine-grained sandy siltstone.</td>
</tr>
<tr>
<td>14:21</td>
<td>14:56</td>
<td>At 23.3 ft BGS. Obviously off the well again. Trip out tools. Shut off drill rig.                 Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>09:02</td>
<td>09:18</td>
<td>At Gum Branch Road area. Crew has brought a section of washerover pipe; length = 25.5 ft (includes subadapter), bit dimensions are 9 1/2-in. OD, 8 1/4-in. ID. Steam clean washerover pipe. Plan to over wash the wellbore to get a better start on the well.</td>
</tr>
<tr>
<td>09:18</td>
<td>09:28</td>
<td>At LL/HAZ-14 site, unload the washerover pipe.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
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<tr>
<td>---------</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2-16-96</td>
<td>0928</td>
<td>Remove bit from drill rod; rack the rod. Pull out the piece of conductor casing.</td>
</tr>
<tr>
<td></td>
<td>0941</td>
<td></td>
</tr>
<tr>
<td>(cont.)</td>
<td>0941</td>
<td>Rig up with the washover pipe.</td>
</tr>
<tr>
<td></td>
<td>0955</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1019</td>
<td>Commence over wash of well. Over wash well casing and annular grout column from approximately 3 ft to 23.7 ft BGS. BZA at 9.5 ft BGS = 0.0 ppm. Encounter water at 11.2 ft BGS. Additional moisture at 13.5 ft BGS. Encounter more water (mud) at 15.0 ft BGS. BZA at 19.8 ft BGS = 0.0 ppm. Cuttings for entire interval consist predominantly of moist clay, with weathered rock evident near end of interval.</td>
</tr>
<tr>
<td></td>
<td>1119</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1125</td>
<td>At 23.7 ft BGS. Break subadapter loose from washover pipe. Radiological scan of cuttings: alpha = 0 cpm, beta/gamma = 50-60 cpm.</td>
</tr>
<tr>
<td></td>
<td>1340</td>
<td>Crew departs for another section of washover pipe (plan to over wash well at least to competent bedrock). Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1407</td>
<td>Crew returns with a 20.7-ft section of washover pipe, steam cleans it, and brings it to the site.</td>
</tr>
<tr>
<td></td>
<td>1425</td>
<td>Rig up the second section of washover pipe, and thread onto lead washover pipe.</td>
</tr>
<tr>
<td></td>
<td>1600</td>
<td>Connection made, continue over wash of well. Over wash casing and annular grout column from 23.7 ft to 40.3 ft BGS. BZA at 28.2 ft and 34.2 ft BGS both read 0.0 ppm. Top of fresh rock at 36.2 ft BGS. Cuttings from 23.7 ft to 36.2 ft BGS consist of light olive brown (5Y 5/6), light olive gray (5Y 5/2), and greenish-gray (5G 6/1) weathered shale with rare cement and PVC fragments.</td>
</tr>
</tbody>
</table>
### Interval also contains minor brownish-gray (5YR 4/1) to greenish-black (5G 2/1), weathered, massive micrite (abundance of which increases with depth). Very hard drilling from 38.5 ft to 39.0 ft (limestone). BZA at 39.2 ft BGS = 0.1 ppm (slight sulfurous odor noted). Hard drilling again at 40.0 ft BGS. Cuttings from 36.2 ft to 40.3 ft BGS are medium bluish-gray (55 5/1), thinly laminated shale and brownish-gray (5YR 4/1), massive micrite with sparite blebs. Carbonate fragments also contain granular calcite vein material. Scan of cutting reads: alpha = 0 cpm, beta/gamma = 70-80 cpm for the interval.

### 1600 - 1612
- At 40.3 ft BGS. Clean out borehole. Clean up, secure site, and depart.

### 2-19-96
#### 0920 - 1000

#### 1000 - 1100
- Commence over wash of well. Over wash casing and annular grout column from 40.3 ft to 40.6 ft BGS. BZA is <8 ppm.

#### 1100 - 1130
- Halt over wash. Making no significant progress. Discuss options with crew; decide to cut washover pipe, leave in the borehole as temporary casing, and continue drilling up the casing/reaming the wellbore with a tricone bit.

#### 1130 - 1215
- Break for lunch.

#### 1215 - 1250
- Cut off washover pipe, leaving approximately 0.5-ft stick-up. Thread a 7 7/8-in. diameter tricone bit on a subadapter onto a 25 ft drill rod; length of bit/subadapter = 1.9 ft, table height = 2.0 ft.

#### 1250 - 1440
- Run bit inside the washover pipe. Commence drilling up the well
<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-16-96 (cont.)</td>
<td>1530</td>
<td>Start drill rig and raise the mast. Attempt to pull out the washover pipe using rotation and hold-back pressure; add compressed air to clear cuttings, but it disappears down the hole (no circulation to surface). Plan to use soap and water to clear cuttings.</td>
</tr>
<tr>
<td>1440</td>
<td>1515</td>
<td>At 74.9 ft BGS. The bit has obviously moved off the well. Will stop here. Clean out borehole. Trip out tools. Secure site and depart.</td>
</tr>
<tr>
<td>2-20-96</td>
<td>0855</td>
<td>Technical oversight resumed by T. Coffey (SAIC). Arrive at LL/HAZ-14 site. Will remove washover pipe before grouting the borehole. Tag bottom of borehole at 74.9 ft BGS. Prepare washover pipe for welding.</td>
</tr>
<tr>
<td>1027</td>
<td>1117</td>
<td>Cut off a portion of the original washover pipe containing the subadapter.</td>
</tr>
<tr>
<td>1117</td>
<td>1153</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td>1153</td>
<td>1232</td>
<td>Weld the two pieces of the washover pipe together.</td>
</tr>
<tr>
<td>1232</td>
<td>1338</td>
<td>Start drill rig and raise the mast. Attempt to pull out the washover pipe using rotation and hold-back pressure; add compressed air to clear cuttings, but it disappears down the hole (no circulation to surface). Plan to use soap and water to clear cuttings.</td>
</tr>
<tr>
<td>1338</td>
<td>1444</td>
<td>Crew departs to get soap and water. Soap is an alcohol-based foaming agent used to &quot;float&quot; cuttings.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
</tr>
<tr>
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<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2-20-96</td>
<td>1444</td>
<td>Crew returns. Pump soap and water through washover pipe; pipe is turning freely, borehole is clean. Begin tripping washover pipe out.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1538</td>
<td>Lead washover pipe out of the borehole. Clean up, secure site, and depart.</td>
</tr>
<tr>
<td>2-21-96</td>
<td>0844</td>
<td>Arrive at LL/HAZ-14 site, using a dozer to get everything on site. Tag bottom of borehole at 71.0 ft BGS (3.9 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 28.2 cubic ft, equivalent to 24.0 sacks of Type I cement.</td>
</tr>
<tr>
<td></td>
<td>0925</td>
<td>Run 1.5-in. OD PVC tremie pipe into the borehole to 67.0 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>0931</td>
<td>Mix and pump-tremie 24 sacks (28.3 cubic ft) of neat, Type I Portland cement (average grout weight of 13.2 lbs/gal) into the borehole. Circulate water, then 50% cement.</td>
</tr>
<tr>
<td></td>
<td>1156</td>
<td>Pull out tremie pipe. Clean up. Secure site and depart.</td>
</tr>
<tr>
<td>2-23-96</td>
<td>0939</td>
<td>At LL/HAZ-14 site. Tag cement level at 6.8 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 1.4 cubic ft, equivalent to 1.2 sacks of Type I cement.</td>
</tr>
<tr>
<td></td>
<td>0949</td>
<td>Mix and pour 2 sacks (2.4 cubic ft) of neat, Type I Portland cement directly into the borehole. Depart site.</td>
</tr>
<tr>
<td>3-1-96</td>
<td>0819</td>
<td>At LL/HAZ-14 site. Tag cement level at 2.2 ft BGS. Cap borehole with clay soil.</td>
</tr>
<tr>
<td></td>
<td>0824</td>
<td>P&amp;A of well LL/HAZ-14 is complete.</td>
</tr>
</tbody>
</table>
## Y-12 PLANT GROUNDWATER PROTECTION PROGRAM
### WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT

**LOCATION:** Gum Branch Road Area  
**DRILLER:** H. Hall - Highland Drilling Co.  
**HELPERS:** J. Monger/E. Lyons - Highland Drilling Co.  
**DRILL:** Ingersoll-Rand XL-750

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-2-95</td>
<td>1334 - 1339</td>
<td>Arrive at P&amp;A 1 site. Well consists of 6 5/8-in. outside diameter (OD) PVC casing (stick-up = 2.8 ft). There is no pad, nor obvious annular cement. Measure water level at 19.0 ft below ground surface (BGS). Tag bottom of well (solid) at 22.0 ft BGS. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 40-50 cpm.</td>
</tr>
<tr>
<td></td>
<td>1339 - 1420</td>
<td>Attach a jawed clamp to the casing, and, using a backhoe, attempt to pull the casing out; the casing begins to come out easily, then holds fast, presumably by the casing collars at depth. Cut the casing off flush with the ground surface. Recover 6.0 ft of 6 5/8-in. OD, schedule 80 PVC casing.</td>
</tr>
<tr>
<td></td>
<td>1420 - 1519</td>
<td>Grub and level the location for the drill rig. Depart site.</td>
</tr>
<tr>
<td>10-3-95</td>
<td>0930 - 1008</td>
<td>Arrive at P&amp;A 1 site. It has been raining, and the location is slick. Shave the wet clay off the surface of the site with the backhoe.</td>
</tr>
<tr>
<td></td>
<td>1008 - 1045</td>
<td>Move drill rig onto location, and position over the well. Set up site.</td>
</tr>
<tr>
<td></td>
<td>1045 - 1053</td>
<td>Attach the jawed clamp to casing, and attempt to pull out using the drill rig; casing comes out a short distance, then stops tight.</td>
</tr>
<tr>
<td></td>
<td>1053 - 1057</td>
<td>Rig up with an 8 3/4-in. bit on a subadapter; total length = 4.3 ft, table height = 2.6 ft.</td>
</tr>
</tbody>
</table>
## WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-3-95</td>
<td>1057</td>
<td>Commence drilling up the casing/reaming the wellbore using compressed air only. Drill/ream from 0.0 ft to 23.7 ft BGS. Top of weathered rock at 4.0 ft BGS. Cuttings from 0.0 ft to 4.0 ft BGS are pale brown (5YR 5/2) to light brown (5YR 6/4), moist clay with weathered shale fragments. Breathing zone analysis (BZA) at 4.3 ft BGS = 0.0 ppm. Encounter moisture at 11.3 ft BGS. BZA at 13.7 ft BGS = 0.0 ppm. Water at 18.7 ft BGS. BZA at 19.7 ft BGS = 0.0 ppm. Fresh rock at 22.0 ft BGS (bottom of wellbore). Cuttings from 4.0 ft to 22.0 ft BGS are light olive brown (5YR 5/6) to dark yellowish-orange (10YR 6/6) and moderate brown (5YR 3/4) to light olive gray (5YR 5/2), thinly laminated, weathered shale; PVC fragments; and &quot;pea&quot; gravel (filter pack). Cuttings from 22.0 ft to 23.7 ft BGS consist of very dusky red-purple (5RP 2/2) and dark greenish-gray (5GY 4/1), thinly laminated shale; brownish-black (5YR 2/1), massive biomicrite with sparite blebs; PVC; and pea gravel.</td>
</tr>
<tr>
<td></td>
<td>1119</td>
<td>At 23.7 ft BGS. Clean out borehole. Trip out tools. Tag bottom of borehole at 22.9 ft BGS (0.8 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 7.9 cubic ft, equivalent to 6.7 sacks of Type I cement.</td>
</tr>
<tr>
<td></td>
<td>1137</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td></td>
<td>1206</td>
<td>Crew departs for grouting supplies and equipment. Oversight departs for a new beta/gamma meter.</td>
</tr>
<tr>
<td></td>
<td>1251</td>
<td>All return. Mix and pour 8 sacks (9.4 cubic ft) of neat, Type I Portland cement (grout weight not measured, no scales available) directly into the borehole. Liquid grout fills the borehole to 1.0 ft BGS.</td>
</tr>
<tr>
<td>DATE</td>
<td>START</td>
<td>FINISH</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>10-3-95</td>
<td>1339</td>
<td>1450</td>
</tr>
<tr>
<td>(cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-4-95</td>
<td>0854</td>
<td>0908</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. P&A 2

WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT

LOCATION: Gum Branch Road Area
DRILLER: H. Hall - Highland Drilling Co.
DRILL: Ingersoll-Rand XL-750

DATE: START: 10-4-95
FINISH: 10-9-95

METHOD: C
LOGGED BY: Timothy Coffey - SAIC

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-4-95</td>
<td>0958</td>
<td>Arrive at P&amp;A 2 site. Well consists of 6 5/8-in. outside diameter (OD) PVC casing (stickup = 2.2 ft). Measure water level at 13.1 ft below ground surface (BGS). Tag bottom of well (solid) at 23.9 ft BGS. Cut off 2.0 ft of the casing stickup.</td>
</tr>
<tr>
<td>1023</td>
<td>1105</td>
<td>Move drill rig onto location, and position over the well. Set up site. Background radiological scan of location: beta/gamma = 50 cpm (no alpha measurement made: wet ground). Raise the mast.</td>
</tr>
<tr>
<td>1105</td>
<td>1109</td>
<td>Wrap a canvas strap around the casing, around a connector that is located just below the ground surface, and attempt to pull out: casing comes out approximately 0.5 ft, then holds fast.</td>
</tr>
<tr>
<td>1109</td>
<td>1113</td>
<td>Rig up with an 8 3/4-in. diameter tricone bit on a subadapter; total length = 4.3 ft, table height = 1.9 ft.</td>
</tr>
<tr>
<td>1113</td>
<td>1205</td>
<td>Break for lunch.</td>
</tr>
<tr>
<td>1205</td>
<td>1222</td>
<td>Commence drilling up the PVC casing/screen and reaming wellbore using compressed air only. Drill/ream from 0.0 ft to 25.4 ft BGS. Top of weathered rock at 4.4 ft BGS. Cuttings from 0.0 ft to 4.4 ft BGS are: grayish-brown (5YR3/2) to dark yellowish-brown (10YR 4/2), moist, clayey topsoil with &quot;pea&quot; gravel and PVC fragments. Breathing zone analysis (BZA) at 6.4 ft BGS = 0.0 ppm. Top of fresh rock at 11.0 ft BGS. Cuttings from 4.4 ft to 11.0 ft BGS consist of dark yellowish-brown (10YR 4/2) to</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
</tr>
<tr>
<td>--------</td>
<td>-------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10-4-95</td>
<td>1222</td>
<td>At 25.4 ft BGS. Clean out borehole. Trip out tools. Tag bottom of the borehole at 23.3 ft BGS (2.1 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 8.1 cubic ft, equivalent to 6.9 sacks of Type I cement. Lower mast.</td>
</tr>
<tr>
<td></td>
<td>1314</td>
<td>Move drill rig away from borehole, and prepare to grout borehole.</td>
</tr>
<tr>
<td></td>
<td>1345</td>
<td>Mix and pour 9 sacks (10.5 cubic ft) of neat, Type I Portland cement (grout weight = 15.0 lbs/gal) directly into the borehole. Liquid cement fills the borehole to 2.0 ft BGS.</td>
</tr>
<tr>
<td></td>
<td>1345</td>
<td>Clean up. Move drill rig to pipeyard. Depart.</td>
</tr>
<tr>
<td>10-9-95</td>
<td>0900</td>
<td>At P&amp;A 2 site. Tag cement level at 3.0 ft BGS. Cap remaining borehole with clay soil.</td>
</tr>
<tr>
<td></td>
<td>0915</td>
<td>P&amp;A of well P&amp;A 2 is complete.</td>
</tr>
</tbody>
</table>
**Y-12 PLANT GROUNDWATER PROTECTION PROGRAM**

**WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT**

| LOCATION: Gum Branch Road Area/Haul Road | DATE: START: 10-6-95 |
| DRILLER: H. Hall - Highland Drilling Co. | FINISH: 10-11-95 |
| HELPERS: E. Lyons/J. Monger - Highland Drilling Co. | METHOD: C |
| DRILL: Ingersoll-Rand XL-750 | LOGGED BY: Timothy Coffey - SAIC |

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ACTIVITY/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-6-95</td>
<td>0850</td>
<td>Arrive at P&amp;A 3 site. Using dozer to prepare the site for the drill rig. Well consists of 6 5/8-in. outside diameter (OD) PVC casing (stickup = 2.8 ft). Measure water level at 24.4 ft below ground surface (BGS). Tag bottom of well (solid) at 35.8 ft BGS. Cut 2.8 ft off of casing stickup.</td>
</tr>
<tr>
<td>0919</td>
<td>0947</td>
<td>Move drill rig onto location, and position over the well. Set up site. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 60-70 cpm.</td>
</tr>
<tr>
<td>0947</td>
<td>1014</td>
<td>Raise the mast. Rig up with an 8 3/4-in. diameter bit on a subadapter; total length = 4.3, table height = 2.4 ft.</td>
</tr>
<tr>
<td>1014</td>
<td>1033</td>
<td>Commence drilling up PVC casing/reaming wellbore using compressed air only. Drill/ream from 0.0 ft to 36.9 ft BGS. Top of weathered rock at 1.2 ft BGS. Cuttings from 0.0 ft to 1.2 ft BGS are light brown (5YR 5/6) and moderate brown (5YR 4/4), moist, silty clay with dark yellowish-orange (10YR 6/6), weathered shale fragments; and PVC fragments. Breathing zone analysis (BZA) at 4.3 ft BGS = 0.0 ppm. Slight moisture at 8.3 ft BGS. BZA at 13.9 ft BGS = 0.0 ppm. Encounter water at 22.9 ft BGS. BZA at 24.9 ft and 30.9 ft BGS both read 0.0 ppm. Cuttings from 1.2 ft to 36.9 ft BGS consist primarily of light olive gray (5Y 5/2), thinly laminated, weathered shale with white (N9) PVC fragments. From 17.9 ft to end of interval, cuttings include quartz and...</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>ACTIVITY/COMMENTS</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10-6-95</td>
<td></td>
<td><strong>feldspathic</strong>&quot;pea&quot;** gravel (<strong>filter pack</strong>). Beta/gamma scan of cuttings measure 50 cpm for the entire interval.</td>
</tr>
<tr>
<td>(cont.)</td>
<td>1033</td>
<td>At 36.9 ft BGS. Clean out borehole. Trip out tools. Tag bottom of borehole at 31.8 ft BGS (5.1 ft BGS of fill). Calculate a borehole volume to 4.0 ft BGS of 11.7 cubic ft, equivalent to 9.9 sacks of Type I cement. Secure rods in carousel. Lower mast.</td>
</tr>
<tr>
<td>1101</td>
<td>1227</td>
<td>Crew departs to get cement and grouting equipment. Break for lunch.</td>
</tr>
<tr>
<td>1227</td>
<td>1308</td>
<td>Technical oversight by S.L. Abston (SAIC). Mix and pour 9 sacks (10.6 cubic ft) of neat, Type I cement directly into the borehole. Liquid cement fills the borehole to the ground surface.</td>
</tr>
<tr>
<td>1308</td>
<td>1400</td>
<td>Clean up. Move drill rig to pipeyard. Depart site.</td>
</tr>
<tr>
<td>10-10-95</td>
<td>0900</td>
<td>At P&amp;A 3 site. Tag cement level at 10.0 ft BGS. Mix and pour 3 sacks (3.5 cubic ft) of neat, Type I Portland cement into borehole. Depart.</td>
</tr>
<tr>
<td>10-11-95</td>
<td>0900</td>
<td>At P&amp;A 3 site. Tag cement level at 2.0 ft BGS. Cap remaining borehole with clay soil.</td>
</tr>
<tr>
<td></td>
<td>0915</td>
<td>P&amp;A of well P&amp;A 3 is complete.</td>
</tr>
</tbody>
</table>

P&A of well P&A 3 is complete.
APPENDIX B
PLUGGING AND ABANDONMENT DIAGRAMS
### WELL CONSTRUCTION SUMMARY

- **Conductor Hole**
  - Dia: -NA-
  - Depth: -NA-

- **Surface Conductor**
  - Type: None
  - Dia: -NA-

- **Borehole Dia.:** 8.0 in.
  - Top: 0.0 ft
  - Bottom: 29.0 ft

- **Filler:** Cement

- **Casing (With Screen)**
  - Type: PVC/#40
  - Dia: 6.5-in. OD
  - Top: 19.0 ft
  - Bottom: 29.0 ft

- **Seal:** -NA-

- **Filter Pack:** Sand

- **Screen**
  - Type: PVC/sl
  - Dia: 6.5-in. OD
  - Top: 19.0 ft
  - Bottom: 29.0 ft

- **Total Depth:** 29.0 ft

---

### P&A SUMMARY

- **Reamed Dia.:** 8 3/4 in.
- **Drilled/Reamed Depth:** 30.0 ft
- **Plug Material:** Cement
- **Cap Material:** Clay soil

---

*Information source: Subsurface Data Base (Y/TS-881/R2)  
-NA-: Not Applicable/Not Available*
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. 1095

LOCATION: Sediment Disposal Basin

COORDINATES: N28088, E63601

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

DATE: START: 2-26-96

DATE: FINISH: 3-5-96

PREPARED BY: Timothy Coffey - SAIC

REFERENCE POINT FOR MEASUREMENTS: (3rd Level surface)

DRILLING COMPANY: Highland Drilling Company

DRILLER: R. Phillips

DRILL: Ingersoll-Rand T4W

PREPARED BY: Timothy Coffey - SAIC

REASON FOR P&A: Obsolete well/substandard construction.

P&A: METHOD: C

DEViations FROM METHOD: Drill up casing while reaming wellbore in one pass; did not ream to 1 ft beyond TD; use of bentonite in plug, with HSEA approval.

WELL CONSTRUCTION SUMMARY*


-NA-: Not Applicable/Not Available.

CONDUCTOR HOLE
DIA: -NA-
DEPTH: -NA-

SURFACE CONDUCTOR
TYPE: None
DIA: -NA-

BOREHOLE DIA.: 8 in.
TOP: 0.0 ft
BOTTOM: 118.0 ft

FILLER: Cement

CASING (WITH SCREEN)
TYPE: PVC/#40
DIA: 6.5-in. OD

SEAL: -NA-

FILTER PACK: -NA-

SCREEN
TYPE: PVC/s.
DIA: 6.5-in. OD

TOTAL DEPTH: 118.0 ft

P&A SUMMARY

REAMED DIA: 8 1/2 in.

DRILLED/REAMED
DEPTH: 117.0 ft

PLUG MATERIAL: Bentonite

CAP MATERIAL: Clay soil

Note: Cuttings left in borehole formed partial obstruction. Grout taken into cavities ended up at unknown depth.

CAP
DEPTH: 3.7 ft
DIA: 8 1/2 in.
CEMENT
DEPTH: 26.0 ft
BENTONITE
DEPTH: 40.6 ft

PLUG
DEPTH: 117.0 ft

DEPTH: 119.5 ft
CONDUCTOR HOLE
DIA: -NA-
DEPTH -NA-

SURFACE CONDUCTOR
TYPE: None
DIA: -NA-
TOP -NA-
BOTTOM -NA-

BOREHOLE DIA.: 8 in.
TOP 0.0 ft
BOTTOM 68.0 ft

FILLER: Cement

CASING (WITH SCREEN)
TYPE: PVC/#40
DIA: 6.5-in. OD
TOP +1.8 ft
BOTTOM 58.0 ft

SEAL: -NA-
TOP -NA-
BOTTOM 57.0 ft

FILTER PACK: -NA-
TOP 57.0 ft
BOTTOM 68.0 ft

SCREEN
TYPE: PVC/sl.
DIA: 6.5-in. OD
TOP 58.0 ft
BOTTOM 68.0 ft

TOTAL DEPTH: 68.0 ft

REAMED DIA: 8 1/2 in.
DRILLED/REAMED
DEPTH: 69.0 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Clay soil

NOTE: Uncertain amount of cuttings remain in borehole after reaming. Grout plug filtered through partial cuttings obstruction to unknown depth.
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. 56-4C

LOCATION: Y-12 Plant Area
DATE: START: 1-24-96
COORDINATES: N29815, E56804
REFERENCE POINT FOR MEASUREMENTS: Ground Surface
PREPARED BY: Timothy Coffey - SAIC
DRILLING COMPANY: Highland Drilling Company
FOREMAN: H. Hall
REASON FOR P&A: Damaged wellhead
P&A METHOD: C

DEVIANATIONS FROM METHOD: Well plugged in place:
Use bentonite as plug, cap with cement to ground surface with HSEA approval.

WELL CONSTRUCTION SUMMARY*

<table>
<thead>
<tr>
<th>CONDUCTOR HOLE DIA.</th>
<th>DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-NA-</td>
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</tbody>
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<table>
<thead>
<tr>
<th>SURFACE CONDUCTOR TYPE</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>-NA-</td>
<td>-NA-</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>BOREHOLE DIA.</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 in.</td>
<td>0.0 ft</td>
<td>76.3 ft</td>
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<table>
<thead>
<tr>
<th>FILLER</th>
<th>TOP</th>
<th>BOTTOM</th>
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<tbody>
<tr>
<td>-NA-</td>
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<td></td>
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<table>
<thead>
<tr>
<th>CASING (WITH SCREEN) TYPE</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC/#40</td>
<td>0.0 ft</td>
<td>71.3 ft</td>
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<table>
<thead>
<tr>
<th>SEAL</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
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<tr>
<td>-NA-</td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FILTER PACK</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
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<tbody>
<tr>
<td>Sand</td>
<td>70.0 ft</td>
<td>70.0 ft</td>
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<tr>
<th>SCREEN TYPE</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS/sw/.01</td>
<td>71.3 ft</td>
<td>76.3 ft</td>
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<table>
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<tr>
<th>TOTAL DEPTH</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>76.3</td>
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P&A SUMMARY

<table>
<thead>
<tr>
<th>REAMED DIA.</th>
<th>DRILLED/REAMED DEPTH</th>
<th>PLUG MATERIAL</th>
<th>CAP MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>NA</td>
<td>Bentonite</td>
<td>Cement</td>
</tr>
</tbody>
</table>

3 in. ID PVC casing to 3.1 ft BGS
DEPTH: 11.5 ft
DIA: 4 1/2 in. OD PVC casing
DEPTH: 73.4 ft

*Information Source: Subsurface Data Base (Y/TS-881/R3)
-NA-: Not Applicable/Not Available
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM
WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. B-1

LOCATION: Urea Pile
COORDINATES: N28499 E61702
DATE: START: 9-22-95
REFERENCE POINT FOR MEASUREMENTS: Ground Surface
PREPARED BY: Timothy Coffey - SAIC
DATE: FINISH: 9-22-95

DRILLING COMPANY: Highland Drilling Company
DRILL: Ingersoll-Rand T4W
DRILLER: H. Hall
HELPERS: R. Phillips/G. Shillings/J. Gallaher

REASON FOR P&A: Obsolete well/substandard construction
P&A METHOD: C
DEVIATIONS FROM METHOD: Drill up PVC casing/screen
while reaming wellbore in one pass; cement to ground surface, with HSEA approval.

WELL CONSTRUCTION SUMMARY

CONDUCTOR HOLE
DIA: -NA-
DEPTH: -NA-

SURFACE CONDUCTOR
TYPE: None
DIA: -NA-
TOP: -NA-
BOTTOM: -NA-

BOREHOLE DIA.: 8.0 in.
TOP: 0.0 ft
BOTTOM: 53.2 ft

FILLER: Cement

CASING (WITH SCREEN)
TYPE: PVC
DIA: 2-in. ID
TOP: +0.6 ft
BOTTOM: 6.0 ft

SEAL: Bentonite
TOP: 2.8 ft
BOTTOM: 4.8 ft

FILTER PACK: Sand
TOP: 4.8 ft
BOTTOM: 17.4 ft

SCREEN
TYPE: PVC/sl
DIA: 2-in. ID
TOP: 6.0 ft
BOTTOM: 21.0 ft

TOTAL DEPTH: 53.2

P&A SUMMARY

REAMED DIA.: 8 3/4 in.
DRILLED/REAMED DEPTH: 54.3 ft
PLUG MATERIAL: Cement
CAP MATERIAL: -NA-

GROUND SURFACE
DIA: 8 3/4 in.
DEPTH: 16.0 ft
PLUG
DEPTH: 54.3 ft
COLLAPSE/FILL

*Information source: Original boring/well installation log.
-NA:- Not Applicable/Not Available
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Urea Pile (East Chestnut Ridge)  DATE: START: 9-21-95
COORDINATES: N28519 E61760  FINISH: 9-22-95
REFERENCE POINT FOR MEASUREMENTS: Ground Surface
PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company  DRILL: Ingersoll-Rand T4W
DRILLER: H. Hall  HELPERS: R. Phillips/G. Shillings/J. Galleher

REASON FOR P&A: Obsolete well/substandard construction
P&A METHOD: C  DEVIATIONS FROM METHOD: Drill up PVC casing/screen while reaming wellbore in one pass; grout to ground surface, with HSEA approval.

WELL CONSTRUCTION SUMMARY*

<table>
<thead>
<tr>
<th>CONDUCTOR HOLE</th>
<th>DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIA: -NA-</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SURFACE CONDUCTOR</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE: None</td>
<td>-NA-</td>
<td>-NA-</td>
</tr>
<tr>
<td>DIA: -NA-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BOREHOLE DIA: 6.0 in.</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0 ft</td>
<td>36.1 ft</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FILLER</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement</td>
<td>+1.9 ft</td>
<td>7.8 ft</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CASING (WITH SCREEN)</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE: PVC</td>
<td>17.8 ft</td>
<td>36.1 ft</td>
</tr>
<tr>
<td>DIA: 2-in. ID</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SEAL</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentonite</td>
<td>5.0 ft</td>
<td>7.0 ft</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FILTER PACK</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand</td>
<td>7.0 ft</td>
<td>18.2 ft</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SCREEN</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE: PVC/sl</td>
<td>7.8 ft</td>
<td>17.8 ft</td>
</tr>
<tr>
<td>DIA: 2-in. ID</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL DEPTH: 36.1

*Information source: Original boring/well installation log.
-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 8 3/4 in.
DRILLED/REAMED DEPTH: 37.5 ft
PLUG MATERIAL: Cement
CAP MATERIAL: -NA-

GROUND SURFACE
DIA: 8 3/4 in.
DEPTH: 35.2 ft
COLLAPSE/FILL:
DEPTH: 37.5 ft
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. GW-002

LOCATION: Oil Landfarm
COORDINATES: N30°294', E47°547'
REFERENCE POINT FOR MEASUREMENTS: Ground Surface
PREPARED BY: Timothy Coffey - SAIC

DATE: START: 9-28-95
FINISH: 10-2-95

DRILLING COMPANY: Highland Drilling Company
DRILL: Ingersoll-Rand XL-750

DRILLER: H. Hall
HELPERS: J. Gallaher/J. Monger

REASON FOR P&A: Damaged well
P&A METHOD: A
DEVIATIONS FROM METHOD: None.

WELL CONSTRUCTION SUMMARY*

Note: Some of the information in this section obtained from field observations.

CONDUCTOR HOLE
DIA: -NA-. DEPTH -NA-

SURFACE CONDUCTOR
TYPE: Steel
5 1/2-in. OD/
DIA: 6 5/8-in. OD

TOP +3.1/1.9
BOTTOM 1.9/NA

BOREHOLE DIA.: NA
TOP 0.0 ft
BOTTOM 60.0 ft

FILLER: Cement

CASING (WITH SCREEN)
TYPE: SS/#304
DIA: 2 3/8-in. OD

TOP +3.4 ft
BOTTOM 52.7 ft

SEAL: -NA-
TOP -NA-
BOTTOM 40.3 ft

FILTER PACK: Sand
TOP 40.3 ft
BOTTOM 60.0 ft

SCREEN
TYPE: SS/SW./.01
DIA: 2 3/8-in. OD

TOP 52.7 ft
BOTTOM 57.7 ft

TOTAL DEPTH: 60.0

*Information Source: Subsurface Data Base (Y/TM-881/R3)
-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 8 3/4 in.
DRILLED/REAMED DEPTH: 62.2 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Clay soil

CAP
DEPTH: 1.0 ft
DIA: 8 3/4 in.

PLUG
DEPTH: 61.6 ft
COLLAPSE
DEPTH: 62.2 ft

96-001MSB(010996) B-9
**Y-12 PLANT GROUNDWATER PROTECTION PROGRAM**

**WELL PLUGGING AND ABANDONMENT DIAGRAM**

<table>
<thead>
<tr>
<th>WELL NO.</th>
<th>GW-007</th>
</tr>
</thead>
</table>

**LOCATION:** Oil Landfarm

**COORDINATES:** N29810 E47981

**DATE:** START: 9-19-95

**FINISH:** 9-21-95

**REFERENCE POINT FOR MEASUREMENTS:** Ground Surface

**PREPARED BY:** Timothy Coffey - SAIC

**DRILLING COMPANY:** Highland Drilling Company

**DRILLER:** H. Hall

**HELPERS:** R. Phillips/J. Gallagher

**REASON FOR P&A:** Obsolete well/substandard construction

**P&A METHOD:** A

**DEVIATIONS FROM METHOD:** Did not ream wellbore to fresh material to 1 ft beyond TD, with HSEA approval

### WELL CONSTRUCTION SUMMARY*

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 ft</td>
<td>6-5/8-in. OD</td>
<td>5.1 ft</td>
</tr>
<tr>
<td>0.0 ft</td>
<td>6.0 in.</td>
<td>16.5 ft</td>
</tr>
<tr>
<td>0.5 ft</td>
<td>2.37-in. OD</td>
<td>12.3 ft</td>
</tr>
<tr>
<td>8.7 ft</td>
<td>Sand</td>
<td>16.5 ft</td>
</tr>
<tr>
<td>12.3 ft</td>
<td>SS/SW/.01</td>
<td>14.3 ft</td>
</tr>
<tr>
<td>16.5 ft</td>
<td>-NA-</td>
<td>-NA-</td>
</tr>
</tbody>
</table>

**REAMED DIA:** 9-1/4 in.

**DRILLED/REAMED DEPTH:** 9.3 ft

**PLUG MATERIAL:** Cement

**CAP MATERIAL:** Clay soil/cuttings

---

*Information Source: Subsurface Data Base (Y/TS-881/R2)
-NA: Not Applicable/Not Available
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Chestnut Ridge Waste Pile
COORDINATES: N27802 E62184
REFERENCE POINT FOR MEASUREMENTS: Ground Surface
PREPARED BY: Timothy Coffey - SAIC
DRILLING COMPANY: Highland Drilling Company
DRILL: Ingersoll-Rand T4W
DRILLERS: R. Phillips/H. Hall
HELPERS: Jim Gallaher/Jerry Gallaher/G. Shillings/R. Jones
DATE: START: 6-22-95
FINISH: 9-20-95

REASON FOR P&A: Well is dry for the majority of the year.
P&A METHOD: A
DEViations FROM METHOD: See activity log.

WELL CONSTRUCTION SUMMARY*

CONDUCTOR HOLE
DIA: NA
DEPTH: 123.0 ft

SURFACE CONDUCTOR
TYPE: Steel
DIA: 10 3/4-in. OD
TOP: +0.4 ft
BOTTOM: 123.0 ft

BOREHOLE DIA.: 10 in.
TOP: 123.0 ft
BOTTOM: 146.0 ft

FILLER: Cement

CASING (WITH SCREEN)
TYPE: SS/#304
DIA: 4.5-in. OD
TOP: +2.3 ft
BOTTOM: 135.9 ft

SEAL: Bentonite
TOP: NA
BOTTOM: 130.4 ft

FILTER PACK: Sand
TOP: 130.4 ft
BOTTOM: 146.0 ft

SCREEN
TYPE: SS/sw/.01
DIA: 4.5-in. OD
TOP: 135.9 ft
BOTTOM: 146.0 ft

TOTAL DEPTH: 146.0

*Information source: Subsurface Data Base (Y/TS-881/R3)
-NA: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 9 7/8 in./13 3/4 in./15 in.
DRILLED/REAMED
DEPTH: 148.4 ft/111.9 ft/107.5 ft
PLUG MATERIAL: Cement/Concrete
CAP MATERIAL: Clay soil

DEPTh: 1.0 ft
DIA: 15 in.
CONCRETE
DEPTH: 87.0 ft
BENTONITE
DEPTH: 102.5 ft
DEPTH: 107.5 ft
DEPTH: 111.9 ft
SURFACE CASING
DEPTH: 131.0 ft
CEMENT
DEPTH: 140.3 ft
DEPTH: 148.4 ft

96-001MS(A)/010996  B-11
**Y-12 PLANT GROUNDWATER PROTECTION PROGRAM**

**WELL PLUGGING AND ABANDONMENT DIAGRAM**

**WELL NO.** GW-297

**LOCATION:** Chestnut Ridge Waste Pile

**COORDINATES:** N27885 E62057

**REFERENCE POINT FOR MEASUREMENTS:** Ground Surface

**PREPARED BY:** Timothy Coffey - SAIC

**DRILLING COMPANY:** Highland Drilling Company

**DRILL:** Ingersoll-Rand XL-750

**DRILLERS:** R. Phillips/H. Hall

**HELPERS:** J. Gallaher/J. Monger

**DATE:** START: 8-4-95

**FINISH:** 8-25-95

**REASON FOR P&A:** Well was dry.

**P&A METHOD:** A

**DEVIACTIONS FROM METHOD:** Unable to ream to 1 ft beyond surface casing set-point due to borehole collapse risk; use of bentonite as plug material, and pouring of cement (no tremie), with HSEA approval.

**WELL CONSTRUCTION SUMMARY**

Note: Some of the information in this section obtained from field observations.

<table>
<thead>
<tr>
<th>Type</th>
<th>Top Depth</th>
<th>Bottom Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONDUCTOR HOLE</td>
<td>-NA-</td>
<td>-NA-</td>
</tr>
<tr>
<td>SURFACE CONDUCTOR</td>
<td>+0.5 ft</td>
<td>105.6 ft</td>
</tr>
<tr>
<td>TYPE: Steel</td>
<td>10 3/4-in. OD</td>
<td>105.6 ft</td>
</tr>
<tr>
<td>BOREHOLE DIA.</td>
<td>10.0 in</td>
<td>120.0 ft</td>
</tr>
<tr>
<td>FILLER: Cement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASING (WITH SCREEN)</td>
<td>+2.2 ft</td>
<td>109.8 ft</td>
</tr>
<tr>
<td>TYPE: SS/#304</td>
<td>4.5-in. OD</td>
<td>109.8 ft</td>
</tr>
<tr>
<td>DIA:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEAL: Bentonite</td>
<td>101.0 ft</td>
<td>107.0 ft</td>
</tr>
<tr>
<td>FILTER PACK: Sand</td>
<td>101.0 ft</td>
<td>107.0 ft</td>
</tr>
<tr>
<td>SCREEN</td>
<td>109.8 ft</td>
<td>120.0 ft</td>
</tr>
<tr>
<td>TYPE: SS/SW/.01</td>
<td>4.5-in. OD</td>
<td>120.0 ft</td>
</tr>
<tr>
<td>DIA:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL DEPTH:</td>
<td>120.0</td>
<td></td>
</tr>
</tbody>
</table>

*Information source: Subsurface Data Base (YTS-881/R2)
-NA: Not Applicable/Not Available

**P&A SUMMARY**

<table>
<thead>
<tr>
<th>Drilled/Reamed Depth</th>
<th>121.0 ft/67.9 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug Material</td>
<td>Cement/Bentonite</td>
</tr>
<tr>
<td>Cap Material</td>
<td>Bentonite/Clay soil</td>
</tr>
</tbody>
</table>

**reamed DIA:** 9 7/8 in./16 in.

**Drilled/Reamed Depth:** 121.0 ft/67.9 ft

**Plug Material:** Cement/Bentonite

**Cap Material:** Bentonite/Clay soil
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-320

LOCATION: Ash Disposal Basin

COORDINATES: N26253.0 E 57084.0

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

DATE: START: 7-16-96

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

FOREMAN: G. Shillings

HELPERS: D. Williford, H. Hall, J. Gallagher

DATE: FINISH: 7-18-96

REASON FOR P&A: Obstructing a construction project.

P&A METHOD: Plug well in place; cut off casing stick-up flush with ground surface, with HSEA approval.

P&A SUMMARY

REAMED DIA.: NA

DRILLED/REAMED DEPTH: NA

Bentonite aggregate/ cement

PLUG MATERIAL: cement

CAP MATERIAL: NA

WELL CONSTRUCTION SUMMARY*

CONDUCTOR HOLE

DIA.: NA

DEPTH NA

SURFACE CONDUCTOR

TYPE: None

DIA.: NA

TOP NA

BOTTOM NA

BOREHOLE DIA.: 8 in.

FILLER: Cement

TOP 0.0 ft

BOTTOM 200.0 ft

Casing (with screen)

TYPE: SS/#304

DIA: 4 1/2-in. OD

TOP +2.9 ft

BOTTOM 100.0 ft

Seal: Bentonite

TOP NA

BOTTOM 97.5 ft

Filter Pack: Sand

TOP 97.5 ft

BOTTOM 115.0 ft

Screen

TYPE: SS/sw/.01

DIA: 4 1/2-in. OD

TOP 100.0 ft

BOTTOM 110.0 ft

TOTAL DEPTH: 200.0 ft

*Information Source: Subsurface Data Base (Y/T881/R3)

-NA: Not Applicable/Not Available

96-001MS(G)081296  B-13
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. GW-321

LOCATION: Ash Disposal Basin

COORDINATES: N25275.0 E 57026.0

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

DATE: START: 7-16-96
FINISH: 7-18-96

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

FOREMAN: G. Shillings
HELPERS: D. Williford, H. Hall, J. Gallaher

REASON FOR P&A: Obstructing a construction project.

P&A METHOD: A
DEVIANATIONS FROM METHOD: Plug well in place; cut off casing stick-up flush with ground surface, with HSEA approval.

### WELL CONSTRUCTION SUMMARY*

<table>
<thead>
<tr>
<th>HOLE</th>
<th>DIA.</th>
<th>DEPTH</th>
<th>ACTUAL</th>
<th>ORIG.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONDUCTOR HOLE</td>
<td>NA</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SURFACE CONDUCTOR</td>
<td>None</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOREHOLE</td>
<td>8 in.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASING (WITH SCREEN)</td>
<td>SS/#304</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEAL</td>
<td>Bentonite</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FILTER PACK</td>
<td>Sand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCREEN</td>
<td>SS/swi.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL DEPTH</td>
<td>98.6 ft</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Information Source: Subsurface Data Base (Y/TS-881/R3)
-NA-: Not Applicable/Not Available

### P&A SUMMARY

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>86.7 ft</td>
<td>Bentonite aggregate/cement</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>98.4 ft</td>
<td>GROUND SURFACE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>98.0 ft</td>
<td>CEMENT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>86.7 ft</td>
<td>BENTONITE AGGREGATE</td>
</tr>
</tbody>
</table>

96-001M(G)/061296 B-14
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. GW-44a

LOCATION: Gum Branch Road Area

COORDINATES: N29885 E31738

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey - SAIC

DATE: START: 8-28-95

DATE: FINISH: 8-30-95

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: H. Hall

HELPERS: R. Phillips/J. Gallagher

REASON FOR P&A: Obsolete well/substandard construction

P&A METHOD: C

DEVIATIONS FROM METHOD: Drill up well casing/screen while reaming the wellbore in one pass, with HSEA approval.

WELL CONSTRUCTION SUMMARY

Note: Some of the information in this section obtained from field observations.

CONDUCTOR HOLE
DIA: -NA-

DEPTH: -NA-

SURFACE CONDUCTOR
TYPE: Steel
DIA: 6 5/8-in. OD

TOP: +1.8 ft

BOTTOM: 0.5 ft

BOREHOLE DIA.: 6.13-in.

TOP: 0.0 ft

BOTTOM: 44.5 ft

FILLER: Cement

CASING (WITH SCREEN)
TYPE: PVC/#40
DIA: 2.37-in. OD

TOP: +1.6 ft

BOTTOM: 34.2 ft

SEAL: -NA-

FILTER PACK: Sand

SCREEN
TYPE: PVC/sil./.01
DIA: 2.37-in. OD

TOP: 34.2 ft

BOTTOM: 44.3 ft

TOTAL DEPTH: 44.5

P&A SUMMARY

REAMED DIA: 8 3/4-in.

DRILLED/REAMED DEPTH: 45.6 ft

PLUG MATERIAL: Cement

CAP MATERIAL: Clay soil

96-001MS(A)/113095
**Y-12 PLANT GROUNDWATER PROTECTION PROGRAM**

**WELL NO.** GW-452

**WELL PLUGGING AND ABANDONMENT DIAGRAM**

**LOCATION:** Gum Branch Road Area

**COORDINATES:** N29768 E32591

**REFERENCE POINT FOR MEASUREMENTS:** Ground Surface

**DATE:**
- **START:** 8-28-95
- **FINISH:** 8-29-95

**PREPARED BY:** Timothy Coffey - SAIC

**DRILLING COMPANY:** Highland Drilling Company

**DRILL:** Ingersoll-Rand XL-750

**DRILLER:** H. Hall

**HELPERS:** R. Phillips/J. Gallaher

**REASON FOR P&A:** Obsolete well/substandard construction.

**P&A METHOD:** C

**DEVIATIONS FROM METHOD:** Drill up PVC casing / screen while reaming wellbore in one pass, with HSEA approval.

---

**WELL CONSTRUCTION SUMMARY**

*Note: Some of the information in this section obtained from field observations.*

- **CONDUCTOR HOLE**
  - **DIA.:** -NA-
  - **DEPTH:** -NA-

- **SURFACE CONDUCTOR**
  - **TYPE:** Steel
  - **DIA.:** 6 5/8-in. OD
  - **TOP:** +2.2 ft
  - **BOTTOM:** 0.8 ft

- **BOREHOLE DIA.:** 6.63 in
  - **TOP:** 0.0 ft
  - **BOTTOM:** 19.0 ft

- **FILLER:** Cement

- **CASING (WITH SCREEN)**
  - **TYPE:** PVC/#40
  - **DIA.:** 2.37-in. OD
  - **TOP:** +2.2 ft
  - **BOTTOM:** 8.7 ft

- **SEAL:** -NA-
  - **TOP:** -NA-
  - **BOTTOM:** -NA-

- **FILTER PACK:** Sand
  - **TOP:** 7.6 ft
  - **BOTTOM:** 18.6 ft

- **SCREEN**
  - **TYPE:** PVC/sl./.01
  - **DIA.:** 2.37-in. OD
  - **TOP:** 8.7 ft
  - **BOTTOM:** 18.6 ft

- **TOTAL DEPTH:** 19.0

---

**P&A SUMMARY**

- **REAMED DIA.:** 8 3/4 in.

- **DRILLED/REAMED DEPTH:** 20.0 ft

- **PLUG MATERIAL:** Cement

- **CAP MATERIAL:** Clay soil

---

*Information source: Subsurface Data Base (Y/TS-881/R2)*

-NA-: Not Applicable/Not Available
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

<table>
<thead>
<tr>
<th>LOCATION: East Fork Poplar Creek</th>
<th>DATE: START: 4-29-96</th>
</tr>
</thead>
<tbody>
<tr>
<td>COORDINATES: N 32818.80 E 63543.11</td>
<td>DATE: FINISH: 4-29-96</td>
</tr>
<tr>
<td>REFERENCE POINT FOR MEASUREMENTS: Ground Surface</td>
<td></td>
</tr>
<tr>
<td>PREPARED BY: Timothy Coffey - SAIC</td>
<td></td>
</tr>
<tr>
<td>DRILLING COMPANY: Highland Drilling Company</td>
<td>DRILL: Altec Auger Truck</td>
</tr>
<tr>
<td>DRILLER: J. Gallaher</td>
<td>HELPER: G. Shillings</td>
</tr>
<tr>
<td>REASON FOR P&amp;A: Obsolete well</td>
<td></td>
</tr>
<tr>
<td>P&amp;A METHOD: A</td>
<td>DEVIATIONS FROM METHOD: Well casing over washed and wellbore reamed in one pass; use of bentonite aggregate as plug, with HSEA approval</td>
</tr>
</tbody>
</table>

WELL CONSTRUCTION SUMMARY*

| CONDUCTOR HOLE | DEPTH | NA |
| DIA: -NA- | |
| SURFACE CONDUCTOR | TOP +3.9 ft | BOTTOM 3.1 ft |
| TYPE: Steel | DIA: 6.5/8-in. OD |
| BOREHOLE DIA.: 8.3/4-in. | TOP 0.0 ft | BOTTOM 11.0 ft |
| FILLER: Cement | |
| CASING (WITH SCREEN) | TOP +3.1 ft | BOTTOM 8.4 ft |
| TYPE: SS/#304 | DIA: 2.37-in. OD |
| SEAL: Bentonite | TOP -NA- | BOTTOM 7.3 ft |
| FILTER PACK: Sand | TOP 7.3 ft | BOTTOM 10.4 ft |
| SCREEN | TOP 8.4 ft | BOTTOM 10.4 ft |
| TYPE: SS/sw/.01 | DIA: 2.37-in. OD |
| TOTAL DEPTH: 11.0 ft | |

P&A SUMMARY

| REAMED DIA: | 12 in |
| DRILLED/REAMED DEPTH: | 11.6 ft |
| PLUG MATERIAL: Bentonite aggregate |
| CAP MATERIAL: Clay soil |

*Information Source: Subsurface Data Base (Y/TS-881/R3)
-NA: Not Applicable/Not Available
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-669

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: East Fork Poplar Creek

DATE: START: 4-30-96
FINISH: 4-30-96

COORDINATES: N 40249.42 E 50619.24

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company
DRILL: Altec Auger Truck

DRILLER: H. Hall
HELPER: G. Shillings

REASON FOR P&A: Obsolete well

P&A METHOD: A
DEVIANCTIONS FROM METHOD: Use of bentonite aggregate for plug, with HSEA approval.

WELL CONSTRUCTION SUMMARY*

NOTE: Some of the information in the following section obtained from field observations.

| CONDUCTOR HOLE | DIA: -NA- | DEPTH -NA- |
| SURFACE CONDUCTOR | TYPE: Steel | DIA: 6.5/8-in. OD |
| BOREHOLE DIA.: 8 3/4-in. |
| FILLER: Cement |
| CASING (WITH SCREEN) | TYPE: SS/304 | DIA: 2.37-in. OD |
| SEAL: Bentonite |
| FILTER PACK: Sand |
| SCREEN | TYPE: SS/sw/.01 | DIA: 2.37-in. OD |
| TOTAL DEPTH: 9.4 ft |

*Information Source: Subsurface Data Base (Y/TS-881/R3)
-NA: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 12 in.
DRILLED/REAMED DEPTH: 9.7 ft
PLUG MATERIAL: Bentonite aggregate
CAP MATERIAL: Clay soil

CAP DEPTH: 2.7 ft
PLUG DIA: 12 in.
COLLAPSE/FILL DEPTH: 9.7 ft

Source: Subsurface Data Base (Y/TS-881/R3)
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. GW-670

LOCATION: East Fork Poplar Creek
DATE: START: 5-2-96
COORDINATES: N 40236.83 E 50616.34 FINISH: 5-7-96
REFERENCE POINT FOR MEASUREMENTS: Ground Surface
PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company
DRILL: Ingersoll-Rand XL-750
DRILLER: J. Young HELPER: G. Shillings/J. Gallaher

REASON FOR P&A: Obsolete well
P&A METHOD: A
DEVIATIONS FROM METHOD: None

WELL CONSTRUCTION SUMMARY*

NOTE: Some of the information in the following section obtained from field observations.

CONDUCTOR HOLE
DIA: -NA- DEPTH -NA-

SURFACE CONDUCTOR
TYPE: Steel
DIA: 11-in. ID

BOREHOLE DIA.: 8.3/4-in.
TOP -NA- BOTTOM 21.84 ft

FILLER: Cement

CASING (WITH SCREEN)
TYPE: SS/#304
DIA: 4.5-in. OD

SEAL: Bentonite

FILTER PACK: Sand

SCREEN
TYPE: SS/sw/01
DIA: 4.5-in. OD

TOTAL DEPTH: 21.84 ft

*Information Source: Subsurface Data Base (Y/TS-881/R3)
-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 9 7/8 in./16 in.
DRILLED/REAMED
DEPTH: 22.9 ft/8.3 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Clay soil

CAP
DEPTH: 3.6 ft
DIA: 16 in.

DEPTH: 8.3 ft

DIA: 9 7/8 in.

DEPTH: 22.9 ft
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-671

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: East Fork Poplar Creek

COORDINATES: N 40106.43 E 50605.00

DATE: START: 5-7-96

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ford 555B Backhoe w/ McMillan Diggerhead

DRILLER: D. Key

HELPER: G. Shillings/J. Gallaher

REASON FOR P&A: Obsolete well

P&A METHOD: A

DEVIANTIONS FROM METHOD: Bentonite plug not hydrated for 4 hours, with HSEA approval.

**WELL CONSTRUCTION SUMMARY**

- **CONDUCTOR HOLE**
  - DIA: -NA-  DEPTH: -NA-

- **SURFACE CONDUCTOR**
  - TYPE: Steel  
  - DIA: 6 1/8 in. OD
  - TOP: +3.6 ft  
  - BOTTOM: 1.2 ft

- **BOREHOLE DIA.: 8 3/4 in.**
  - TOP: 0.0 ft  
  - BOTTOM: 8.9 ft

- **FILLER:** Cement

- **CASING (WITH SCREEN)**
  - TYPE: SS/#304  
  - DIA: 2.37 in. OD
  - TOP: +2.4 ft  
  - BOTTOM: 5.6 ft

- **SEAL:** Bentonite
  - TOP: -NA-  
  - BOTTOM: 3.5 ft

- **FILTER PACK:** Sand
  - TOP: 3.5 ft  
  - BOTTOM: 7.6 ft

- **SCREEN**
  - TYPE: SS/sw.01  
  - DIA: 2.37 in. OD
  - TOP: 5.6 ft  
  - BOTTOM: 7.6 ft

- **TOTAL DEPTH:** 8.9 ft

**P&A SUMMARY**

- **REAMED DIA:** 12 in.
- **DRILLED/REAMED DEPTH:** 8.8 ft
- **PLUG MATERIAL:** Bentonite aggregate
- **CAP MATERIAL:** Clay soil

**CAP**
- DEPTH: 3.4 ft
- DIA: 12 in.

**PLUG**
- DEPTH: 8.8 ft

*Information Source: Subsurface Data Base (YITS-881/R3)
-NA: Not Applicable/Not Available*
**Y-12 PLANT GROUNDWATER PROTECTION PROGRAM**

**WELL PLUGGING AND ABANDONMENT DIAGRAM**

**WELL NO.** GW-672

**LOCATION:** Ash Disposal Basin  
**COORDINATES:** N26269.06 E 57042.11

**DATE:**  
**START:** 7-16-96  
**FINISH:** 7-18-96

**REFERENCE POINT FOR MEASUREMENTS:** Ground Surface

**PREPARED BY:** Timothy Coffey - SAIC

**DRILLING COMPANY:** Highland Drilling Company  
**DRILL:** NA

**FOREMAN:** G. Shillings  
**HELPERS:** D. Williford, H. Hall, J. Gallaher

**REASON FOR P&A:** Obstructing a construction project

**P&A METHOD:** A  
**DEVIANES FROM METHOD:** Plug well in place; cut off casing stick-up flush with ground surface, with HSEA approval.

---

**WELL CONSTRUCTION SUMMARY**

<table>
<thead>
<tr>
<th>Component</th>
<th>Top Depth</th>
<th>Bottom Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borehole DIA.</td>
<td>8 in.</td>
<td>28.0 ft</td>
</tr>
<tr>
<td>Cement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casing (with Screen) Type</td>
<td>SS/#304</td>
<td></td>
</tr>
<tr>
<td>DIA</td>
<td>4 1/2-in. OD</td>
<td></td>
</tr>
<tr>
<td>Seal</td>
<td>Bentonite</td>
<td></td>
</tr>
<tr>
<td>Filter Pack</td>
<td>Sand</td>
<td></td>
</tr>
<tr>
<td>Screen Type</td>
<td>SS/sw/.01</td>
<td></td>
</tr>
<tr>
<td>DIA</td>
<td>4 1/2-in. OD</td>
<td></td>
</tr>
<tr>
<td>Total Depth</td>
<td>28.0 ft</td>
<td></td>
</tr>
</tbody>
</table>

---

**P&A SUMMARY**

<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reamed Dia</td>
<td>NA</td>
</tr>
<tr>
<td>Drilled/Reamed Depth</td>
<td>NA</td>
</tr>
<tr>
<td>Plug Material</td>
<td>Bentonite aggregate/cement</td>
</tr>
<tr>
<td>Cap Material</td>
<td>NA</td>
</tr>
</tbody>
</table>

---

**Information Source:** Subsurface Data Base (Y/TS-881/R3)  
**NA:** Not Applicable/Not Available
**Y-12 PLANT GROUNDWATER PROTECTION PROGRAM**

**WELL PLUGGING AND ABANDONMENT DIAGRAM**

| LOCATION: Water Treatment Plant (East Pine Ridge) | DATE: START: 9-18-95 |
| COORDINATES: N31°28'7" E63°15'8" | FINISH: 9-19-95 |
| REFERENCE POINT FOR MEASUREMENTS: Ground Surface | PREPARED BY: Timothy Coffey - SAIC |
| DRILLING COMPANY: Highland Drilling Company | DRILL: Ford 455 Backhoe |
| OPERATOR: G. Shillings | HELPER: H. Hall |
| REASON FOR P&A: Obsolete well/substandard construction | |
| P&A METHOD: C | DEVIATIONS FROM METHOD: Did not ream to fresh material; plug constructed of bentonite aggregate, with HSEA approval. |

**WELL CONSTRUCTION SUMMARY**

- **Surface Conductor**
  - **Type:** None
  - **DIA.:** -NA-
  - **TOP:** -NA-
  - **BOTTOM:** -NA-

- **Borehole Dia.:** 22.0 in.
  - **TOP:** 0.0 ft
  - **BOTTOM:** 6.0 ft

- **Filler:** Bentonite

- **Casing (with Screen)**
  - **Type:** PVC/SL/40
  - **DIA.:** 12 3/4-in. OD
  - **TOP:** +1.5 ft
  - **BOTTOM:** 4.0 ft

- **Seal:** -NA-
  - **TOP:** -NA-
  - **BOTTOM:** -NA-

- **Filter Pack:** Sand
  - **TOP:** 3.0 ft
  - **BOTTOM:** 6.0 ft

- **Screen**
  - **Type:** PVC/SL/02
  - **DIA.:** 12 3/4-in. OD
  - **TOP:** 4.0 ft
  - **BOTTOM:** 6.0 ft

- **Total Depth:** 6.0 ft

*Information source: Subsurface Data Base (YTS-881/R2).* -NA-: Not Applicable/Not Available

**P&A SUMMARY**

- **Reamed Dia.:** -NA-
- **Drilled/Reamed Depth:** -NA-
- **Plug Material:** Bentonite
- **Cap Material:** Clay soil

**CAP**
- **Depth:** 1.2 ft
- **Dia.:** 22 in.
- **Bentonite**
- **Dia.:** 12 3/4 in.
- **Collapse/Fill Depth:** 6.0 ft
- **Depth:** 4.5 ft
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Gum Branch Road Area
COORDINATES: N29781 E32123
REFERENCE POINT FOR MEASUREMENTS: Present Ground Surface
PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company
DRILL: Ingersoll-Rand XL-750
DRILLER: H. Hall HELPERS: R. Phillips/J. Galaher

REASON FOR P&A: Obsolete well/substandard construction.

P&A METHOD: C
DEVATIONS FROM METHOD: Drill up casing/screen while reaming the wellbore in one pass, with HSEA approval.

WELL CONSTRUCTION SUMMARY*

Note: Some of the information in this section obtained from field observations.

CONDUCTOR HOLE
DIA: -NA-
DEPTH -NA-

SURFACE CONDUCTOR
TYPE: None
DIA: -NA-

BOREHOLE DIA.: 8.0-in.
TOP 0.0 ft
BOTTOM 30.0 ft

FILLER: Cement

CASING (WITH SCREEN)
TYPE: PVC/#40
DIA: 6.5-in. OD
TOP +2.2 ft
BOTTOM 10.0 ft

SEAL: -NA-

FILTER PACK: Sand

SCREEN
TYPE: PVC
DIA: 6.5-in. OD
TOP 10.0 ft
BOTTOM 30.0 ft

TOTAL DEPTH: 30.0

P&A SUMMARY

REAMED DIA.: 8 3/4-in.
DRILLED/REAMED
DEPTH: 29.1 ft**
PLUG MATERIAL: Cement
CAP MATERIAL: Clay soil

CAP DEPTH: 3.6 ft
DIA: 8 3/4-in.

PLUG DEPTH: 28.2 ft
Collapse/fill

**Depth is 1.4 ft beyond pre-P&A TD tag.

*Information source: Subsurface Data Base (Y/T8-861/R2)
-NA-: Not Applicable/Not Available

91M-1059

B-23
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

<table>
<thead>
<tr>
<th>WELL NO.</th>
<th>LL/HAZ-11</th>
</tr>
</thead>
</table>

**LOCATION:** Gum Branch Road Area

**COORDINATES:** N 30223.26 E 32138.38

**REFERENCE POINT FOR MEASUREMENTS:** Ground Surface

**DATE:**
- **START:** 2-21-96
- **FINISH:** 3-4-96

**DRILLING COMPANY:** Highland Drilling Company

**DRILL:** Ingersoll-Rand XL-750

**DRILLER:** R. Phillips

**HELPERS:** H. Hall

**REFERENCE POINT FOR MEASUREMENTS:** Near surface

**PREPARED BY:** Timothy Coffey - SAIC

**REASON FOR P&A:** Obsolete well.

**P&A METHOD:** C

**DEVIATIONS FROM METHOD:** Drill up casing while reaming wellbore in one pass, with HSEA approval.

### WELL CONSTRUCTION SUMMARY*

<table>
<thead>
<tr>
<th>Surface</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>NA</td>
</tr>
<tr>
<td>8.5 in.</td>
<td>NA</td>
</tr>
<tr>
<td>6.5 in.</td>
<td>NA</td>
</tr>
<tr>
<td>6.5 in.</td>
<td>NA</td>
</tr>
<tr>
<td>6.5 in.</td>
<td>NA</td>
</tr>
</tbody>
</table>

**P&A SUMMARY**

<table>
<thead>
<tr>
<th>REAMED DIA.:</th>
<th>8 1/2 in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILLED/REAMED DEPTH.:</td>
<td>34.3 ft</td>
</tr>
<tr>
<td>PLUG MATERIAL:</td>
<td>Cement</td>
</tr>
<tr>
<td>CAP MATERIAL:</td>
<td>Clay soil</td>
</tr>
</tbody>
</table>

**TOTAL DEPTH:** 33.0 ft

---

*Information Source: Subsurface Data Base (Y/TB-881/R3)
-NA-: Not Applicable/Not Available
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM
WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Gum Branch Road Area

COORDINATES: N30°09' E32°12'

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILLER: H. Hall

HELPERS: R. Phillips/J. Gallaher

DATE: START: 8-31-95

DATE: FINISH: 9-5-95

REFERENCE POINT FOR MEASUREMENTS: Ground surface

REASON FOR P&A: Obsolete well/substandard construction.

P&A METHOD: C

DEVIATIONS FROM METHOD: Drill up casing/screen while reaming wellbore in one pass, with HSEA approval.

WELL CONSTRUCTION SUMMARY*

Note: Some of the information in this section obtained from field observations.

CONDUCTOR HOLE

DIA: -NA-

DEPTH: -NA-

SURFACE CONDUCTOR

TYPE: None

DIA: -NA-

TOP: -NA-

BOTTOM: -NA-

BOREHOLE DIA.: 8.0 in.

TOP: 0.0 ft

BOTTOM: 35.0 ft

FILLER: Cement

CASING (WITH SCREEN)

TYPE: PVC/#40

DIA: 6.5-in. OD

TOP: +1.0 ft

BOTTOM: 15.0 ft

SEAL: -NA-

TOP: -NA-

BOTTOM: -NA-

FILTER PACK: Sand

TOP: 1.0 ft

BOTTOM: 35.0 ft

SCREEN

TYPE: PVC

DIA: 6.5-in. OD

TOP: 15.0 ft

BOTTOM: 35.0 ft

TOTAL DEPTH: 35.0

P&A SUMMARY

REAMED DIA.: 8 3/4 in.

DRILLED/REAMED

DEPTH: 36.3 ft

PLUG MATERIAL: Cement

CAP MATERIAL: Clay soil

*Information source: Subsurface Data Base (Y/TS-881/R2)

-NA-: Not Applicable/Not Available
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM
WELL NO. UL/HAZ-14

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Gum Branch Road Area

DATE: START: 2-15-96

COORDINATES: N 30236.57 E 32157.15

DATE: FINISH: 3-1-96

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

LOCATION: Gum Branch Road Area

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: H. Hall

HELPERS: R. Phillips

REASON FOR P&A: Obsolete well.

P&A METHOD: C

DEVIATIONS FROM METHOD: Unable to drill up casing/ream wellbore to total depth due to drill bit deviation from the borehole, with HSEA approval.

WELL CONSTRUCTION SUMMARY*

CONDUCTOR HOLE
DIA: -NA-
DEPTH: -NA-

SURFACE CONDUCTOR
TYPE: None
DIA: -NA-

BOREHOLE DIA.: 6.13 in
TOP: 0.0 ft
BOTTOM: 350.0 ft

FILLER: Cement

CASING (WITH SCREEN)
TYPE: PVC/#40
DIA: 2.37-in. OD
TOP: +2.3 ft
BOTTOM: 339.0 ft

SEAL: -NA-
TOP: -NA-
BOTTOM: 338.0 ft

FILTER PACK: Sand
TOP: 338.0 ft
BOTTOM: 349.0 ft

SCREEN
TYPE: PVC/sv.01
DIA: 2.37-in. OD
TOP: 339.0 ft
BOTTOM: 349.0 ft

TOTAL DEPTH: 350.0

P&A SUMMARY

REAMED DIA: 9 1/2 in./7 7/8 in.

DRILLED/REAMED
DEPTH: 40.6 ft/74.9 ft

PLUG MATERIAL: Cement

CAP MATERIAL: Clay soil

*Information Source: Subsurface Data Base (Y/TS-881/R3)
-NA: Not Applicable/Not Available
P&A SUMMARY
Note: All of the information in this section obtained from field observations.

<table>
<thead>
<tr>
<th>Well Construction Summary</th>
<th>P&amp;A Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conductor Hole</strong></td>
<td><strong>Reamed Dia:</strong> 8 3/4 in.</td>
</tr>
<tr>
<td>Dia: -NA-</td>
<td><strong>Drilled/Reamed</strong></td>
</tr>
<tr>
<td><strong>Surface Conductor</strong></td>
<td><strong>Depth:</strong> 23.7 ft</td>
</tr>
<tr>
<td>Type: None</td>
<td><strong>Plug Material:</strong> Cement</td>
</tr>
<tr>
<td>Dia: -NA-</td>
<td><strong>Cap Material:</strong> Clay soil</td>
</tr>
<tr>
<td><strong>Borehole Dia:</strong></td>
<td><strong>Filler:</strong> None</td>
</tr>
<tr>
<td>Top: -NA-</td>
<td><strong>Depth:</strong> 2.0 ft</td>
</tr>
<tr>
<td>Bottom: -NA-</td>
<td><strong>Dia:</strong> 8 3/4 in.</td>
</tr>
<tr>
<td><strong>Casing (with Screen)</strong></td>
<td><strong>Collapse/Fill</strong></td>
</tr>
<tr>
<td>Type: PVC/#80</td>
<td><strong>Depth:</strong> 22.9 ft</td>
</tr>
<tr>
<td>Dia: 6 5/8-in. OD</td>
<td><strong>Depth:</strong> 23.7 ft</td>
</tr>
<tr>
<td>Top: +2.8 ft</td>
<td><strong>Screen</strong></td>
</tr>
<tr>
<td>Bottom: -NA-</td>
<td><strong>Type:</strong> PVC</td>
</tr>
<tr>
<td><strong>Seal:</strong> -NA-</td>
<td><strong>Dia:</strong> 6 5/8-in. OD</td>
</tr>
<tr>
<td>Top: -NA-</td>
<td><strong>Top:</strong> -NA-</td>
</tr>
<tr>
<td>Bottom: -NA-</td>
<td><strong>Bottom:</strong> 22.0 ft</td>
</tr>
<tr>
<td><strong>Filter Pack:</strong> Pea gravel</td>
<td><strong>Total Depth:</strong> -NA-</td>
</tr>
<tr>
<td><strong>Screen</strong></td>
<td><strong>Total Depth:</strong> -NA-</td>
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<tr>
<td><strong>Type:</strong> PVC</td>
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<tr>
<td><strong>Dia:</strong> 6 5/8-in. OD</td>
<td><strong>Total Depth:</strong> -NA-</td>
</tr>
</tbody>
</table>

-NA-: Not Applicable/Not Available
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Gum Branch Road Area

COORDINATES: N 30.840  E 27.850 (Estimated)

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: H. Hall  HELPER: R. Phillips/E. Lyons

REASON FOR P&A: Obsolete well/substandard construction.

P&A METHOD: C DEVIATIONS FROM METHOD: Drill up PVC casing/ screen while reaming wellbore in one pass, with HSEA approval.

WELL CONSTRUCTION SUMMARY

Note: All of the information in this section obtained from field observations.

-NA-: Not Applicable/Not Available

REamed Dia.: 8 3/4 in.

DRILLED/REAMED

DEPTH: 25.4 ft

PLUG MATERIAL: Cement

CAP MATERIAL: Clay Soil

TOTAL DEPTH: -NA-
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

| LOCATION: | Gum Branch Road Area/Haul Road |
| DATE: START: | 10-6-95 |
| DATE: FINISH: | 10-11-95 |
| COORDINATES: | N29.810 E36.790 (Estimated) |
| REFERENCE POINT FOR MEASUREMENTS: | Ground Surface |
| PREPARED BY: Timothy Coffey - SAIC |
| DRILLING COMPANY: | Highland Drilling Company |
| DRILLER: | H. Hall |
| HELPERS: | E. Lyons/J. Monger |
| REASON FOR P&A: | Obsolete well/substandard construction. |
| P&A METHOD: | C |
| DEVIATIONS FROM METHOD: | Drill up PVC casing/screen while reaming wellbore in one pass, with HSEA approval. |

**WELL CONSTRUCTION SUMMARY**

- **CONDUCTOR HOLE**
  - DIA.: -NA-
  - DEPTH: -NA-

- **SURFACE CONDUCTOR**
  - TYPE: None
  - DIA.: -NA-
  - TOP: -NA-
  - BOTTOM: -NA-

- **BOREHOLE DIA.:**
  - TOP: 0.0 ft
  - BOTTOM: -NA-

- **FILLER:**
  - -NA-

- **CASING (WITH SCREEN)**
  - TYPE: PVC/#80
  - DIA.: 6 5/8-in. OD
  - TOP: +2.8 ft
  - BOTTOM: -NA-

- **SEAL:**
  - -NA-

- **FILTER PACK:**
  - Gravel

- **SCREEN**
  - TYPE: PVC
  - DIA.: 6 5/8-in. OD
  - TOP: -NA-
  - BOTTOM: 35.8 ft

- **TOTAL DEPTH:**
  - -NA-

**P&A SUMMARY**

- **REAMED DIA.:** 8 3/4 in.
- **DRILLED/REAMED DEPTH:** 36.9 ft
- **PLUG MATERIAL:** Cement
- **CAP MATERIAL:** Clay Soil

- **CAP**
  - DEPTH: 2.0 ft
  - DIA: 8 3/4 in.

- **PLUG**
  - DEPTH: 31.8 ft
  - COLLAPSE/FILL
  - DEPTH: 36.9 ft

-NA-: Not Applicable/Not Available
APPENDIX C
WASTE MANAGEMENT PLAN
C.1. INTRODUCTION

The ultimate objective of monitoring groundwater is gathering data to assess potential impacts to human health and the environment. It is also the objective of the Y-12 Groundwater Protection Program (GWPP) to handle drill cuttings from the installation of groundwater monitoring wells or borings in a manner that protects the environment. The Y-12 philosophy has been and continues to be consistent with the U.S. Environmental Protection Agency (EPA) and Lockheed Martin Energy Systems, Inc., (Energy Systems) guidance for managing well cuttings. Site-specific professional judgment is used to determine the potential for contamination prior to installation of each well. Factors considered in evaluating potential for site contamination include:

- previously collected sampling and analysis data,
- groundwater flow patterns,
- geologic and hydrogeologic setting, and
- purpose of well (contaminant plume assessment, background monitoring defining lines of compliance, etc.).

Based on the evaluation, one of two options is selected:

- stabilize material on site or
- collect for treatment or storage.

C.2. DRILL CUTTINGS DISPOSAL

There are two levels of drill cuttings management at the Y-12 Plant: (1) drill-site disposal and (2) containerization for waste disposal. Disposal of drill cuttings at the drill site following best management practices (BMP) is permitted if the cuttings do not exceed the field-screening criteria discussed below. If the field-screening criteria are exceeded, the cuttings must be containerized at the drill site, labeled, and handled according to Y-12 Plant waste disposal procedures. Sampling and field screening of the drill cuttings will be conducted in accordance with the procedures specified in the Energy Systems Environmental Surveillance Procedures Quality Control Program document (ESH/Sub/87/21706/1).

C.2.1 FIELD SCREENING

Field screening of drill cuttings will consist of measuring three parameters: radioactivity, volatile organics, and pH. The Energy Systems procedures specified in Table C.1 will be followed with some modification as described below.

Radioactivity will be measured using two separate meters: a survey meter with a pancake Geiger tube for determining beta and gamma activity and a scintillation counter with a zinc sulfide window for determining alpha activity. The meters will be passed over the surface area of the cuttings and the highest readings will be recorded.

Screening for organic vapors will be conducted on a composite sample from the cuttings generated at a single well. The sample will be collected with a hand trowel or similar tool to select cuttings from several depths. Enough cuttings will be placed in a clean 1-quart glass or metal container to half fill it. Aluminum foil will be placed over the mouth of the container to make an airtight seal. The sample will then be incubated for 1 h at 70°F or the ambient temperature, whichever is higher. Organic vapors in the headspace of the sample container will be measured by puncturing the aluminum foil and inserting the probe of an organic vapor analyzer. This instrument will have a photoionization detector with a 10.2 eV...
lamp or a flame ionization detector and will be calibrated to isobutylene. The highest reading of the headspace vapors will be recorded.

**Table C.1. Y-12 Plant field-screening criteria for drill cuttings and development water**

<table>
<thead>
<tr>
<th>Field analysis</th>
<th>Old Energy Systems Procedure No.</th>
<th>New Energy Systems Procedure No.</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>ESP-307-2</td>
<td>ESP-307-1</td>
<td>4.0–10.5</td>
</tr>
<tr>
<td>Specific conductivity a</td>
<td>ESP-307-8</td>
<td>ESP-307-1</td>
<td>&lt; 1000 μmhos/cm</td>
</tr>
<tr>
<td>Organic</td>
<td>ESP-307-6</td>
<td>Same</td>
<td>&lt; 5 ppm</td>
</tr>
<tr>
<td>Radioactivity</td>
<td>ESP-307-7</td>
<td>Same</td>
<td>&lt; 600 dpm/100 cm² (&lt; 100 cpm)</td>
</tr>
<tr>
<td>beta/gamma</td>
<td></td>
<td></td>
<td>&lt; 1000 dpm/100 cm² (&lt; 500 cpm)</td>
</tr>
</tbody>
</table>

a Not applicable to drill cuttings.

The pH of the cuttings will be estimated by adding one quart of deionized water to the composite sample used to determine the presence of organic vapors. The sample will be agitated until well mixed. The pH of the mixture will be determined by moistening a piece of pH paper (range 4-9 or similar) and checking the color of the paper against the color key. This pH will be recorded.

**C.2.2 CONTAINERIZATION FOR WASTE DISPOSAL**

If the cuttings from a borehole exceed any one of the field screening limits, they will be containerized at the drill site and appropriately labeled with the contents (drill cuttings), borehole number, and date. The cuttings will then be handled according to Y-12 Plant waste management procedures.

An exception to the above may be made if the cuttings exceed the organic vapor limits. Weather permitting, those cuttings may be passively treated by aeration at the drill site to reduce the organic vapor content. Such treatment shall not exceed 5 working days. If reanalysis following aeration indicates the cuttings continue to exceed the organic vapor limits, they must be containerized and handled as above. In the case well plugging and abandonment, grout cuttings generated during drilling activities may result in elevated pH levels falsely indicative of contamination. If grout cuttings are observed and no other indicator exceeds containerization limits, then cuttings may be disposed at the drill site.

**C.2.3 BEST MANAGEMENT PRACTICES FOR DRILL SITE DISPOSAL**

Drill cuttings that do not exceed the field-screening criteria will be disposed of at the drill site, if practicable. BMP dictate that the cuttings be disposed in such a way as to not be unsightly or cause erosion/sedimentation impacts on nearby surface water. The cuttings shall therefore be used as part of the
restoration of the drill site, to fill in low areas and tire tracks, or spread to conform to the natural topography. They will subsequently be seeded and mulched. If bedrock cuttings contain a liquid fraction, care shall be taken to ensure this liquid infiltrates or evaporates at the drill site and in no case runs off into surface waters, ephemeral drainages, or storm sewers. Drill cuttings that do not exceed the field-screening criteria but cannot be disposed of at the drill site due to its location (parking lot, yard, etc.) will be transported to a designated location and disposed of as clean fill, following BMP.

C.2.4 DOCUMENTATION

The results of all field-screening analyses and a description of the disposition of the drill cuttings from each borehole will be documented on a Drill Cuttings Field Screening/Disposal Sheet (Figures C.1 and C.2). These forms will be completed for each borehole by the on-site geologist who conducts the screening. A copy of each form will be provided to the Project Manager of the GWPP within 2 days of its completion.

3. DEVELOPMENT WATER DISPOSAL

There are two levels of development water management at the Y-12 Plant: (1) drill-site disposal and (2) containerization for waste disposal. Disposal of development water at the drill site following BMP is permitted if the water does not exceed the field-screening criteria discussed below. If the field-screening criteria are exceeded, the water must be containerized at the drill site, labeled, and handled according to Y-12 Plant waste disposal procedures. Sampling and field screening of development water will be conducted in accordance with the procedures specified in the Energy Systems Environmental Surveillance Procedures Quality Control Program document (ESH/Sub/87/21706/1).

C.3.1 FIELD SCREENING

Initial development water will be containerized until it has been screened. This is accomplished by pumping the water into drums or other suitable container(s). Screening will be conducted on grab samples taken approximately every hour after the first one-half hour of development. (An alternative to the hourly grab samples is to totally contain all the development water produced at a well, then analyze a composite sample.) If initial grab samples do not exceed the limits specified in Table C.1, development water may be pumped directly on the ground (following BMP) unless or until a subsequent grab sample exceeds the limits.

Field screening of development water will consist of measuring four parameters: radioactivity, volatile organics, specific conductivity, and pH. The Energy Systems procedures specified in Table C.1 will be followed with some modification, as described below.

Radioactivity will be measured using two separate meters: a survey meter with a pancake Geiger tube for determining beta and gamma activity and a scintillation counter with a zinc sulfide window for determining alpha activity. The meters will be passed over the surface area of the sample and the highest readings will be recorded.

Screening for organic vapors will be conducted by placing enough development water in a clean 1-quart glass or metal container to half fill it. Aluminum foil will be placed over the mouth of the container to make an airtight seal. The sample will then be incubated for 1 h at 70°F or the ambient temperature, whichever is higher. Organic vapors in the headspace of the sample container will be measured by puncturing the aluminum foil and inserting the probe of an organic vapor analyzer. This instrument will have a photoionization detector with a 10.2 eV lamp or a flame ionization detector and will be calibrated to isobutylene. The highest reading of the headspace vapors will be recorded.
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. ___________ SITE: ________________________________

APPROX. VOLUME OF CUTTINGS: ________________________________

CALIBRATION OF INSTRUMENTS: Check those calibrated to manufacturer's specifications.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Date/Time</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>___</td>
<td>(4.0-10.5)</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>___</td>
<td>(&lt;5 ppm)</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>___</td>
<td>(&lt;100 cpm)</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>___</td>
<td>(&lt;500 cpm)</td>
</tr>
</tbody>
</table>

N/A - Not analyzed

Weather: ________________________________ Temp.: ________________________________

DISPOSITION: Drill-site Disposal ________________ Containerization (Labeled?) y / n

Describe:

On-site Geologist (print): ________________________________

Signature: ________________________________ Date: _______

Figure C.1.

95-035MS/093096

C-6
Y-12 PLANT GWPP DEVELOPMENT WATER FIELD SCREENING/DISPOSAL SHEET

WELL NO. ___________________ SITE: ___________________________________________

APPROX. VOLUME OF DEVELOPMENT WATER: _______________________________________

CALIBRATION OF INSTRUMENTS: Check those calibrated to manufacturer’s specifications.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Calibrated</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sp. Cond. meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alpha meter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FIELD SCREENING RESULTS:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>pH</th>
<th>Sp. Cond.</th>
<th>Organic Vapors</th>
<th>Beta/Gamma</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4.0</td>
<td>4000 umhos/cm</td>
<td>(&lt;5 ppm)</td>
<td>(&lt;100 cpm)</td>
<td>(&lt;500 cpm)</td>
</tr>
</tbody>
</table>

Weather: ___________________________________________  Temp.: ________________

DISPOSITION: Drill-site Disposal  Containerization (Labeled?) y/n

On-site Geologist (print): ___________________________________________

Signature: ___________________________________________  Date: ________________

Figure C.2.
C.3.2 CONTAINERIZATION FOR WASTE DISPOSAL

If the development water from a well exceeds any one of the field screening limits, it will be containerized at the drill site and appropriately labeled with the contents (development water), well number, and date. The water will then be handled according to Y-12 Plant waste management procedures.

An exception to this may be made if the development water only exceeds the organic vapor limits. Weather permitting, the water may be passively treated at the drill site by leaving the containers open for aeration to reduce the organic vapor content. Such treatment shall not exceed 5 working days and shall not be conducted over weekends without supervision. If reanalysis following aeration indicates the development water continues to exceed the organic vapor limits, it must be containerized and handled as above.

C.3.3 BMP FOR DRILL-SITE DISPOSAL

Development water that does not exceed the field-screening criteria will be disposed of at the drill site if practicable. BMP dictates that the water be disposed in such a way as to not cause erosion or enter nearby surface water or storm sewers. Precautions shall therefore be taken to ensure that development water pumped onto the ground or released from containers at the drill site either infiltrates or evaporates at the site and in no case runs off into surface waters, ephemeral drainages, or storm sewers. Development water that does not exceed the field screening but cannot be disposed of at the drill site due to site limitations (i.e., within a drainage, near a storm sewer, etc.) will be transported to a designated location and disposed as clean water following BMP.

C.3.4 DOCUMENTATION

The results of all field-screening analyses and a description of the disposition of the development water from each well will be documented on a Development Water Field Screening/Disposal Sheet, an example of which is attached. These forms will be completed for each well by the on-site geologist who conducts the screening. A copy of each form will be provided to the Project Manager of the GWPP within 2 days of its completion.
APPENDIX D
DISPOSAL AND SCREENING RECORDS
WELL/BOREHOLE NO. 1004

SITE: S3 Ponds

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

- pH meter X (model) Horiba Model U-7
- Organic vapor meter X (model) Century-Foxboro OVA Model 128
- Beta/gamma meter X (model) Ludlum Model 3 Survey Meter with G-M Pancake Probe
- Alpha meter X (model) Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe

FIELD SCREENING RESULTS (background/maximum values):

- pH 10.3 Date/Time 9-5-95/1502 (4.0 - 10.5)
- Organic vapors 0.0 ppm/0.0 ppm Date/Time 9-5-95/1500 (<5.0 ppm above background)
- Beta/Gamma 40 cpm/60 cpm Date/Time 9-5-95/1406 (<100 cpm above background)
- Alpha 0 cpm/0 cpm Date/Time 9-5-95/1404 (<500 cpm above background)

Weather: Clear to partly cloudy.
Temp.: Upper 50s to upper 80s °F.

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: [Signature] Date: 9-5-95
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1095

SITE: Sediment Disposal Basin

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Checkmark</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>X</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>X</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>X</td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>X</td>
<td>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</td>
</tr>
</tbody>
</table>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>10.3</td>
<td>2-28-96/1641</td>
<td>(4.0 - 10.5)</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/2.2 ppm</td>
<td>2-28-96/1532</td>
<td>(&lt;5.0 ppm above background)</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>50 cpm/60 cpm</td>
<td>2-28-96/1431</td>
<td>(&lt;100 cpm above background)</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>All readings</td>
<td>(&lt;500 cpm above background)</td>
</tr>
</tbody>
</table>

Weather: Cloudy, clearing mid-day, becoming cloudy again

Temp.: Low 50s°F, falling into the 30s °F

DISPOSITION: Drill-site Disposal X

Containerization (Labeled?) y / n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: ____________________________ Date: 2-28-96
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1096  SITE: Sediment Disposal Basin

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</td>
</tr>
</tbody>
</table>

FIELD SCREENING RESULTS (background/maximum observed values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>10.1</td>
<td>2-27-96/1301</td>
<td>4.0 - 10.5</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/1.2 ppm</td>
<td>2-27-96/1259</td>
<td>&lt;5.0 ppm above background</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>40 cpm/50 cpm</td>
<td>2-27-96/1157</td>
<td>&lt;100 cpm above background</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>2-27-96/1155</td>
<td>&lt;500 cpm above background</td>
</tr>
</tbody>
</table>

Weather: Partly to mostly cloudy
Temp.: Upper-40s°F to low 70s °F

DISPOSITION: Drill-site Disposal X Containerization (Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: [Signature]
Date: 2-27-96
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. B-1

SITE: Urea Pile (East Chestnut Ridge)

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

- pH meter (model) Horiba Model U-7
- Organic vapor meter (model) Century-Foxboro OVA Model 128
- Beta/gamma meter (model) Ludlum Model 3 Survey Meter with G-M Pancake Probe
- Alpha meter (model) Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe

FIELD SCREENING RESULTS (background/maximum observed values):

- pH 11.5* Date/Time 9-22-95/1144 (4.0 - 10.5)
- Organic vapors 0.0 ppm/0.3 ppm Date/Time 9-22-95/1142 (<5.0 ppm above background)
- Beta/Gamma 40 cpm/50 cpm Date/Time 9-22-95/1047 (<100 cpm above background)
- Alpha 0 cpm/0 cpm Date/Time 9-22-95/1045 (<500 cpm above background)

*Elevated pH measurement due to cement fragments in cuttings composite.

Weather: Cloudy and rainy Temp.: Mid- to upper-60s °F

DISPOSITION: Drill-site Disposal X Containerization (Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: ___________________________ Date: 9-22-95
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. B-3

SITE: Urea Pile (East Chestnut Ridge)

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

- pH meter X (model) Horiba Model U-7
- Organic vapor meter X (model) Century-Foxboro OVA Model 128
- Beta/gamma meter X (model) Ludlum Model 3 Survey Meter with G-M Pancake Probe
- Alpha meter X (model) Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe

FIELD SCREENING RESULTS (background/maximum observed values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>11.4*</td>
<td>9-21-95/1331</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/0.2 ppm</td>
<td>9-21-95/1329</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>40 cpm/40 cpm</td>
<td>9-21-95/1228</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>9-21-95/1226</td>
</tr>
</tbody>
</table>

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Cloudy with scattered light rain
Temp.: Mid-60's to low-80's

DISPOSITION: Drill-site Disposal X Containerization (Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: [Signature] Date: 9-21-95
WELL/BOREHOLE NO. GW-002 SITE: Oil Landfarm

APPROX. VOLUME OF CUTTINGS: —NA—

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</td>
</tr>
</tbody>
</table>

FIELD SCREENING RESULTS (background/maximum observed values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Date/Time</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>9-28-95/1457</td>
<td>11.1* (4.0 - 10.5)</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>9-29-95/1126</td>
<td>400 ppm (4.0 ppm above background)</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>9-29-95/1126</td>
<td>400 cpm (100 cpm above background)</td>
</tr>
<tr>
<td>Alpha</td>
<td>9-29-95/1126</td>
<td>0 cpm (500 cpm above background)</td>
</tr>
</tbody>
</table>

* Elevated pH reading due to cement fragments in cuttings composite.

Weather: 9-28-95: Clear to partly cloudy
Temp.: 9-28-95: Low-50s to near 80 °F
Weather: 9-29-95: Mostly clear
Temp.: 9-29-95: Low-50s to near 80 °F

Disposition: Drill-site Disposal X Containerization

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: ____________________________ Date: 9-29-95
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-007 SITE: Oil Landform

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</td>
</tr>
</tbody>
</table>

FIELD SCREENING RESULTS (background/maximum values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Date/Time</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>9-20-95/1212</td>
<td>11.7*</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>9-20-95/1103</td>
<td>0.0 ppm/7.5 ppm**</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>9-20-95/1001</td>
<td>40 cpm/50 cpm</td>
</tr>
<tr>
<td>Alpha</td>
<td>9-20-95/0959</td>
<td>0 cpm/0 cpm</td>
</tr>
</tbody>
</table>

* Elevated pH reading due to cement fragments in cuttings composite.
** Initial headspace analysis above onsite disposal limits, sample re-sealed and measured after 1-hr incubation had following reading: 3.3 ppm.

Weather: Cloudy, clearing in p.m. Temp.: Upper 50s to low 80s °F.

Disposition: Drill-site Disposal X Containerization (Labeled?) y/n

Describe: Cuttings used to cap remaining borehole after grouting.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: [Signature] Date: 9-20-95
**Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET**

**WELL/BOREHOLE NO.** GW-295  
**SITE:** Chestnut Ridge Waste Pile

**APPROX. VOLUME OF CUTTINGS:** -NA-

**CALIBRATION OF INSTRUMENTS** (check those instruments calibrated to manufacturer's specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</td>
</tr>
</tbody>
</table>

**FIELD SCREENING RESULTS** (background/maximum observed values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>11.8*</td>
<td>6-22-95/1538</td>
<td>4.0 - 10.5</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/3.7 ppm</td>
<td>6-23-95/1245</td>
<td>&lt;5.0 ppm above background</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>50 cpm/70 cpm</td>
<td>7-20-95/1538</td>
<td>&lt;100 cpm above background</td>
</tr>
<tr>
<td>Alpha</td>
<td>10 cpm/10 cpm</td>
<td>7-13-95/1420</td>
<td>&lt;500 cpm above background</td>
</tr>
</tbody>
</table>

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Refer to field logbooks.  
Temp.: Refer to field logbooks.

**DISPOSITION**: Drill-site Disposal X Containerization (Labeled?) y/n

Describe: Cuttings discharged to cuttings pit on location.

**Onsite Geologist (print):** Timothy Coffey - SAIC

Signature:  
Date: 9-14-95
WELL/BOREHOLE NO.  GW-297  SITE: Chestnut Ridge Waste Pile

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

- pH meter  X  (model)  Horiba Model U-7
- Organic vapor meter  X  (model)  Century-Foxboro OVA Model 128
- Beta/gamma meter  X  (model)  Ludlum Model 3 Survey Meter with G-M Pancake Probe
- Alpha meter  X  (model)  Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe

FIELD SCREENING RESULTS (background/maximum values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>12.2*</td>
<td>8-4-95/1609</td>
<td>(4.0 - 10.5)</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/0.2 ppm</td>
<td>8-8-95/1316</td>
<td>(&lt;5.0 ppm above background)</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>40 cpm/80 cpm</td>
<td>8-9-95/1540</td>
<td>(&lt;100 cpm above background)</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>All Readings</td>
<td>(&lt;500 cpm above background)</td>
</tr>
</tbody>
</table>

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Refer to field logbook.  Temp.: Refer to field logbook.

DISPOSITION: Drill-site Disposal  X  Containerization  (Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey/Victor Harness - SAIC

Signature:  Date: 8-21-95
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

<table>
<thead>
<tr>
<th>WELL/BOREHOLE NO.</th>
<th>GW-448</th>
<th>SITE:</th>
<th>Gum Branch Road Area</th>
</tr>
</thead>
</table>

**APPROX. VOLUME OF CUTTINGS:** -NA-

**CALIBRATION OF INSTRUMENTS** (check those instruments calibrated to manufacturer's specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>Ludlum Model 3 Survey Meter</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>Ludlum Model 12 Count Ratemeter</td>
</tr>
</tbody>
</table>

**FIELD SCREENING RESULTS** (background/maximum values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>11.2*</td>
<td>8-29-95/1155</td>
<td>(4.0 - 10.5)</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/0.1 ppm</td>
<td>8-29-95/1153</td>
<td>(&lt;5.0 ppm above background)</td>
</tr>
<tr>
<td>Beta/gamma</td>
<td>60 cpm/60 cpm</td>
<td>8-29-95/1053</td>
<td>(&lt;100 cpm above background)</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>8-29-95/1051</td>
<td>(&lt;500 cpm above background)</td>
</tr>
</tbody>
</table>

*Elevated pH reading due to cement fragments in cuttings composite.*

**Weather:** Clear and hot

**Temp.:** Low-60s to mid-90s °F.

**DISPOSITION:** Drill-site Disposal X Containerization (Labeled?) y/n

*Describe:* Cuttings discharged to ground surface.

**Onsite Geologist (print):** Timothy Coffey - SAIC

**Signature:** [Signature] Date: 8-29-95
WELL/BOREHOLE NO. GW-452

SITE: Gum Branch Road Area

APPROX. VOLUME OF CUTTINGS: NA

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

- pH meter (model) Horiba Model U-7
- Organic vapor meter (model) Century-Foxboro OVA Model 128
- Beta/gamma meter (model) Ludlum Model 3 Survey Meter with G-M Pancake Probe
- Alpha meter (model) Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe

FIELD SCREENING RESULTS (background/maximum values):

- pH 10.9* Date/Time 8-28-95/1412 (4.0 - 10.5)
- Organic vapors 0.0 ppm/0.0 ppm Date/Time 8-28-95/1410 (<5.0 ppm above background)
- Beta/Gamma 60 cpm/70 cpm Date/Time 8-28-95/1312 (<100 cpm above background)
- Alpha 0 cpm/0 cpm Date/Time 8-28-95/1311 (<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Clear and hot
Temp.: Mid-60s to low-90s °F.

DISPOSITION: Drill-site Disposal X Containerization

(Labeled? ) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: [Signature]
Date: 8-28-95

D-13
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

<table>
<thead>
<tr>
<th>WELL/BOREHOLE NO.</th>
<th>GW-660</th>
<th>SITE:</th>
<th>East Fork Poplar Creek</th>
</tr>
</thead>
</table>

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>X (model)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</td>
</tr>
<tr>
<td>Mercury vapor meter</td>
<td>Jerome Model 411</td>
</tr>
</tbody>
</table>

FIELD SCREENING RESULTS (background/maximum observed values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>10.3</td>
<td>4-29-96/1529</td>
<td>(4.0 - 10.5)</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/54 ppm*</td>
<td>4-29-96/1510</td>
<td>(&lt;5.0 ppm above background)</td>
</tr>
<tr>
<td>Beta/gamma</td>
<td>70 cpm/90 cpm</td>
<td>4-29-96/1304</td>
<td>(&lt;100 cpm above background)</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>All readings</td>
<td>(&lt;500 cpm above background)</td>
</tr>
<tr>
<td>Mercury vapor</td>
<td>0 mg/m³/0 mg/m³</td>
<td>All readings</td>
<td>(&lt;0.05 mg/m³)</td>
</tr>
</tbody>
</table>

*Elevated headspace reading from unknown source. Cuttings allowed to aerate 24 hours, resampled and tested with the following results: 3.4 ppm.

Weather: Partly to mostly cloudy and breezy  Temp.: Mid-60s to mid-80s °F

DISPOSITION: Drill-site Disposal X Containerization (Labeled?) y/n

Describe: Cuttings discharged to ground surface. Steel and stainless steel casings and screen split lengthwise. Casing, screen, and concrete fragments staged near well site pending Health Physics screening. Clean concrete to be disposed of in the Landfill, clean steel to be sent to the New Salvage Yard.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: ___________________________ Date: 4-29-96
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. | GW-669 | SITE: | East Fork Poplar Creek

APPROX. VOLUME OF CUTTINGS: | -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer’s specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>Ludlum Model 12 Count Rate Meter with Scintillation Tube Probe</td>
</tr>
<tr>
<td>Mercury vapor meter</td>
<td>Jerome Model 411</td>
</tr>
</tbody>
</table>

FIELD SCREENING RESULTS (background/maximum observed values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>9.8</td>
<td>4-30-96/1405</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/0.0 ppm</td>
<td>4-30-96/1401</td>
</tr>
<tr>
<td>Beta/gamma</td>
<td>40 cpm/50 cpm</td>
<td>4-30-96/1256</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>4-30-96/1254</td>
</tr>
<tr>
<td>Mercury vapor</td>
<td>0 mg/m³/0 mg/m³</td>
<td>4-30-96/1403</td>
</tr>
</tbody>
</table>

Weather: Mostly cloudy and breezy | Temp.: Low- to upper-50s °F

DISPOSITION: Drill-site Disposal | Containerization (Labeled?) y/n

Describe: Cuttings discharged to ground surface. Steel and stainless steel casings and screen split lengthwise. Casing, screen, and concrete fragments staged near well site pending Health Physics screening. Clean (uncontaminated) concrete to be disposed of in the Landfill, clean steel to be sent to the New Salvage Yard.

C sitio Geologist (print): Timothy Coffey - SAIC

Signature: [Signature] | Date: 4-30-96
**Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET**

**WELL/BOREHOLE NO.**   GW-670    **SITE:**   East Fork Poplar Creek

**APPROX. VOLUME OF CUTTINGS:**   -NA-

**CALIBRATION OF INSTRUMENTS**  (check those instruments calibrated to manufacturer's specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Model/Calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>Ludlum Model 12 Count Rate Meter with Scintillation Tube Probe</td>
</tr>
<tr>
<td>Mercury vapor meter</td>
<td>Jerome Model 411/Jerome Model 431-X</td>
</tr>
</tbody>
</table>

**FIELD SCREENING RESULTS**  (background/maximum observed values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>11.8*</td>
<td>5-3-96/1324</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/4.8 ppm</td>
<td>5-3-96/1447</td>
</tr>
<tr>
<td>Beta/gamma</td>
<td>40 cpm/60 cpm</td>
<td>5-3-96/1205</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>All readings</td>
</tr>
<tr>
<td>Mercury vapor</td>
<td>0 mg/m³/0 mg/m³</td>
<td>All readings</td>
</tr>
</tbody>
</table>

*Elevated pH reading due to cement fragments in the cuttings composite.  

**Weather:**  Refer to field logbook  
**Temp.:**  Refer to field logbook

**DISPOSITION:**  Drill-site Disposal X   **Containerization**

**Describe:**  Some cuttings used to cap borehole and fill post holes, remaining cuttings discharged and spread on ground surface at location.  Steel and stainless steel casings and screen split lengthwise.  Casing, screen, and concrete fragments staged near well site pending health physics screening.  Clean (uncontaminated) concrete to be disposed of in the Landfill, clean steel to be sent to the New Salvage Yard.

**Onsite Geologist (print):**  Timothy Coffey - SAIC

**Signature:**  

**Date:**  5-6-96
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-671 SITE: East Fork Poplar Creek

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>X Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>X Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>X Ludlum Model 12 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>X Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</td>
</tr>
<tr>
<td>Mercury vapor meter</td>
<td>X Jerome Model 411</td>
</tr>
</tbody>
</table>

FIELD SCREENING RESULTS (background/maximum observed values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Date/Time</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>5-7-96/1536</td>
<td>10.0</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>5-7-96/1533</td>
<td>0.0 ppm/0.0 ppm</td>
</tr>
<tr>
<td>Beta/gamma</td>
<td>5-7-96/1432</td>
<td>40 cpm/50 cpm</td>
</tr>
<tr>
<td>Alpha</td>
<td>5-7-96/1431</td>
<td>0 cpm/0 cpm</td>
</tr>
<tr>
<td>Mercury vapor</td>
<td>5-7-96/1534</td>
<td>0 mg/m³/0 mg/m³</td>
</tr>
</tbody>
</table>

Weather: Mostly cloudy; rain, sometimes heavy  Temp.: Low-60's to low-70's°F

DISPOSITION: Drill-site Disposal  Containerization

Describe: Some cuttings used to cap borehole, remaining cuttings discharged to ground surface. Steel and stainless steel casings and screen split lengthwise. Casing, screen, and concrete fragments staged near GW-669/GW-670 well sites pending Health Physics screening. Clean (uncontaminated) concrete to be disposed of in the Landfill, clean steel to be sent to the New Salvage Yard.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: [Signature] Date: 5-7-96

96-001MS(P)/080996  D-17
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

<table>
<thead>
<tr>
<th>WELL/BOREHOLE NO.</th>
<th>LL/HAZ-06</th>
<th>SITE:</th>
<th>Gum Branch Road Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPROX. VOLUME OF CUTTINGS:</td>
<td>-NA-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</td>
</tr>
</tbody>
</table>

FIELD SCREENING RESULTS (background/maximum values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>8.1</td>
<td>8-30-95/1147</td>
<td>(4.0 - 10.5)</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/0.4 ppm</td>
<td>8-30-95/1145</td>
<td>(&lt;5.0 ppm above background)</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>40 cpm/40 cpm</td>
<td>8-30-95/1048</td>
<td>(&lt;100 cpm above background)</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>8-30-95/1046</td>
<td>(&lt;500 cpm above background)</td>
</tr>
</tbody>
</table>

Weather: Clear to partly cloudy, hot.  
Temp.: Mid-60s to mid-90s °F.

DISPOSITION: Drill-site Disposal  
Containerization (Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print):  
Timothy Coffey - SAIC

Signature:  
Date: 8-30-95
**Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET**

**WELL/BOREHOLE NO.**  LL/HAZ-11  
**SITE:**  Gum Branch Road Area  

**APPROX. VOLUME OF CUTTINGS:**  -NA-  

**CALIBRATION OF INSTRUMENTS**  
(check those instruments calibrated to manufacturer's specifications):  

<table>
<thead>
<tr>
<th>Instrument</th>
<th>X</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td></td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td></td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td></td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td></td>
<td>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</td>
</tr>
</tbody>
</table>

**FIELD SCREENING RESULTS**  
(background/maximum observed values):  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>8.4</td>
<td>2-22-96/1426</td>
<td>(4.0 - 10.5)</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/0.5 ppm</td>
<td>2-22-96/1424</td>
<td>(&lt;5.0 ppm above background)</td>
</tr>
<tr>
<td>Beta/gamma</td>
<td>50 cpm/70 cpm</td>
<td>2-22-96/1323</td>
<td>(&lt;100 cpm above background)</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>2-22-96/1321</td>
<td>(&lt;500 cpm above background)</td>
</tr>
</tbody>
</table>

**Weather:**  Cloudy  
**Temp.:**  Mid-40s to low 50s °F  

**DISPOSITION:**  Drill-site Disposal  

**Describe:**  Cuttings discharged to ground surface.  

**Onsite Geologist (print):**  Timothy Coffey - SAIC  

**Signature:**  [Signature]  
**Date:**  2-22-96
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO.  LU/HAZ-12
SITE: Gum Branch Road Area

APPROX. VOLUME OF CUTTINGS: NA

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

- pH meter X (model) Horiba Model U-7
- Organic vapor meter X (model) Century-Foxboro OVA Model 128
- Beta/gamma meter X (model) Ludlum Model 3 Survey Meter with G-M Pancake Probe
- Alpha meter X (model) Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe

FIELD SCREENING RESULTS (background/maximum values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Unit (background)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>8.6</td>
<td>8-31-95/1229</td>
<td>4.0 - 10.5</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/0.1 ppm</td>
<td>8-31-95/1227</td>
<td>&lt;5.0 ppm above background</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>60 cpm/80 cpm</td>
<td>8-31-95/1126</td>
<td>&lt;100 cpm above background</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>8-31-95/1126</td>
<td>&lt;500 cpm above background</td>
</tr>
</tbody>
</table>

Weather: Clear, hot, and humid.

Temp.: Mid-60s to near 90 °F.

DISPOSITION: Drill-site Disposal X Containerization (Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC
Signature: [Signature]
Date: 8-31-95
WELL/BOREHOLE NO.  L/HAZ-14  SITE:  Gum Branch Road Area

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

- pH meter: X  (model) Horiba Model U-7
- Organic vapor meter: X  (model) Century-Foxboro OVA Model 128
- Beta/gamma meter: X  (model) Ludlum Model 3 Survey Meter with G-M Pancake Probe
- Alpha meter: X  (model) Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe

FIELD SCREENING RESULTS (background/maximum observed values):

- **pH**: 11.1*  Date/Time: 2-16-96/1653  (4.0 - 10.5)
- **Organic vapors**: 0.0 ppm/0.2 ppm  Date/Time: 2-15-96/1330  (<5.0 ppm above background)
- **Beta/gamma**: 50 cpm/80 cpm  Date/Time: 2-16-96/1609  (<100 cpm above background)
- **Alpha**: 0 cpm/30 cpm  Date/Time: 2-19-96/1440  (<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Refer to field logbooks  Temp.: Refer to field logbooks

DISPOSITION: Drill-site Disposal  X  Containerization  
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:  

Date: 2-20-96
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. P&A 1 SITE: Gum Branch Road Area

APPROX. VOLUME OF CUTTINGS: NA

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</td>
</tr>
</tbody>
</table>

FIELD SCREENING RESULTS (background/maximum observed values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Background/Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>8.7</td>
<td>10-3-95/1345</td>
<td>(4.0 - 10.5)</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/2.7 ppm</td>
<td>10-3-95/1344</td>
<td>(&lt;5.0 ppm above background)</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>40 cpm/60 cpm</td>
<td>10-3-95/1245</td>
<td>(&lt;100 cpm above background)</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>10-3-95/1243</td>
<td>(&lt;500 cpm above background)</td>
</tr>
</tbody>
</table>

Weather: Cloudy and rainy, sometimes heavy rain. Temp.: Low-60s to mid-70s °F

DISPOSITION: Drill-site Disposal X Containerization (Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: [Signature]

Date: 10-3-95
Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. | P&A 2 | SITE: | Gum Branch Road Area

APPROX. VOLUME OF CUTTINGS: | -NA-

CALIBRATION OF INSTRUMENTS (check those instruments calibrated to manufacturer's specifications):

| Instrument              | (model) | Calibration
|-------------------------|---------|--------------
| pH meter                | Horiba Model U-7 |
| Organic vapor meter    | Century-Foxboro OVA Model 128 |
| Beta/gamma meter        | Ludlum Model 3 Survey Meter with G-M Pancake Probe |
| Alpha meter             | Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe |

FIELD SCREENING RESULTS (background/maximum observed values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>8.9</td>
<td>10-4-95/1358</td>
<td>(4.0 - 10.5)</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/2.9 ppm</td>
<td>10-4-95/1356</td>
<td>(&lt;5.0 ppm above background)</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>40 cpm/60 cpm</td>
<td>10-4-95/1306</td>
<td>(&lt;100 cpm above background)</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>10-4-95/1306</td>
<td>(&lt;500 cpm above background)</td>
</tr>
</tbody>
</table>

Weather: Cloudy, light rain in a.m. |
Temp.: Low-60s to low-70s °F

DISPOSITION: Drill-site Disposal X |
Containerization (Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: ____________________________ Date: 10-4-95
### Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

<table>
<thead>
<tr>
<th>WELL/BOREHOLE NO.</th>
<th>P&amp;A 3</th>
<th>SITE:</th>
<th>Gum Branch Road Area/Haul Road</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPROX. VOLUME OF CUTTINGS:</td>
<td>-NA-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CALIBRATION OF INSTRUMENTS** (check those instruments calibrated to manufacturer’s specifications):

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH meter</td>
<td>Horiba Model U-7</td>
</tr>
<tr>
<td>Organic vapor meter</td>
<td>Century-Foxboro OVA Model 128</td>
</tr>
<tr>
<td>Beta/gamma meter</td>
<td>Ludlum Model 3 Survey Meter with G-M Pancake Probe</td>
</tr>
<tr>
<td>Alpha meter</td>
<td>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</td>
</tr>
</tbody>
</table>

**FIELD SCREENING RESULTS** (background/maximum observed values):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date/Time</th>
<th>Background/Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>8.6</td>
<td>10-6-95/1213</td>
<td>(4.0 - 10.5)</td>
</tr>
<tr>
<td>Organic vapors</td>
<td>0.0 ppm/1.1 ppm</td>
<td>10-6-95/1211</td>
<td>(&lt;5.0 ppm above background)</td>
</tr>
<tr>
<td>Beta/Gamma</td>
<td>40 cpm/60 cpm</td>
<td>10-6-95/1103</td>
<td>(&lt;100 cpm above background)</td>
</tr>
<tr>
<td>Alpha</td>
<td>0 cpm/0 cpm</td>
<td>10-6-95/1101</td>
<td>(&lt;500 cpm above background)</td>
</tr>
</tbody>
</table>

Weather: Partly to mostly cloudy
Temp.: Upper 50s to low-70s °F

**DISPOSITION:** Drill-site Disposal X Containerization (Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: ____________________________ Date: 10-6-95
APPENDIX E
EQUIPMENT DECONTAMINATION SUMMARIES
LOCATlON: S3 Ponds        DATE: START: 9-5-95        DECONTAMINATION CREW: H. Hall/J. Gallaher        FINISH: 9-7-95

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand XL-750 (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>9-1-95</td>
<td>9-5-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>9-1-95</td>
<td>9-5-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>9-1-95</td>
<td>9-5-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

COMMENTS:
## Equipment Decontamination Inspection Summary

**Location:** Sediment Disposal Basin  
**Date:** Start: 2-28-96  
**Decontamination Crew:** H. Hall  
**Finish:** 3-5-96

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Decon Date</th>
<th>Inspection Date</th>
<th>Inspection (Pass/Fail)</th>
<th>Inspector's Initials</th>
</tr>
</thead>
</table>
| **Drill Rig** (Ingersoll-Rand T4W)  
(Mast, Chassis, Cables, Carousel, Hoses, Etc.) | 2-28-96 | 2-28-96 | Pass | TJC |
| **Drilling Tools** (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.) | 2-28-96 | 2-28-96 | Pass | TJC |
| **Down Hole Tools** (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.) | 2-28-96 | 2-28-96 | Pass | TJC |
| **Well Construction Materials** (Casing, Screen, Centralizers, Etc.) | -NA- | - | - | - |
| **Workover Rig**  
(Mast, Chassis, Cables, Hoses, Etc.) | -NA- | - | - | - |
| **Development Tools** (Tubing, Bailers, Pumps, Etc.) | -NA- | - | - | - |
| **Other Equipment or Re-Inspections (Specify)** | | | | |
| Conductor Casing: 10 3/4-in. OD, 10 18-in. ID, 3.7 ft | 2-28-96 | 2-28-96 | Pass | TJC |

**Comments:**

---

96-001MS(E)/041696   E-4
<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG <em>Ingersoll-Rand T4W</em></td>
<td>2-26-96</td>
<td>2-27-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>(Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>2-26-96</td>
<td>2-27-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>2-26-96</td>
<td>2-27-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conductor casing: 10 3/4-in. OD, 10 1/8-in. ID, 3.7 ft</td>
<td>2-26-96</td>
<td>2-27-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
</tbody>
</table>

COMMENTS:
# Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

## EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

**LOCATION:** Urea Pile (East Chestnut Ridge)

**DATE:** START: 9-22-95

**DECONTAMINATION CREW:** H. Hall/J. Gallagher

**FINISH:** 9-22-95

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand T4W (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>9-21-95</td>
<td>9-22-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>9-21-95</td>
<td>9-22-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>9-21-95</td>
<td>9-22-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
</tbody>
</table>

**COMMENTS:**

---

96-001MS(B)011096      E-6
## Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

### EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

**Location:** Urea Pile (East Chestnut Ridge)  
**Date:** Start: 9-21-95  
**Decontamination Crew:** G. Shillings/J. Gallaher  
**Finish:** 9-22-95

<table>
<thead>
<tr>
<th>Equipment Description</th>
<th>Decon Date</th>
<th>Inspection Date</th>
<th>Inspection (Pass/Fail)</th>
<th>Inspector's Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand T4W (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>9-21-95</td>
<td>9-21-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>9-21-95</td>
<td>9-21-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>9-21-95</td>
<td>9-21-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
<td>-NA-</td>
<td>-NA-</td>
<td>-NA-</td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
<td>-NA-</td>
<td>-NA-</td>
<td>-NA-</td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Ballers, Pumps, Etc.)</td>
<td>-NA-</td>
<td>-NA-</td>
<td>-NA-</td>
<td>-NA-</td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
<td>-NA-</td>
<td>-NA-</td>
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</table>

**Comments:**

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96-001MS(B)/011096  
E-7
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

LOCATION: Oil Landfarm

DATE: START: 9-28-95

DECONTAMINATION CREW: H. Hall/J. Gallaher/J. Monger

FINISH: 10-2-95

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand XL-750 (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>9-22-95</td>
<td>9-28-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>9-22-95</td>
<td>9-28-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>-NA-</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Washover Pipe: 5-in. ID, 6 1/4-in. OD</td>
<td>9-27-95</td>
<td>9-28-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Bit/Subadapter: 8 3/4-in. dia., length = 4.3 ft.</td>
<td>9-28-95</td>
<td>9-28-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
</tbody>
</table>

COMMENTS:
# Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

## EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

**LOCATION:** Oil Landfarm  
**DATE:** START: 9-19-95  
**DECONTAMINATION CREW:** R. Phillips/J. Gallaher  
**FINISH:** 9-21-95

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand T4W (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>9-19-95</td>
<td>9-19-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belts, Clevis, Chains, Etc.)</td>
<td>9-19-95</td>
<td>9-19-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>9-19-95*</td>
<td>9-19-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washover Pipe: 5-in. ID, 6 1/2-in. OD</td>
<td>9-19-95</td>
<td>9-19-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Washover Pipe: 8-in. ID, 9 1/4-in. OD</td>
<td>9-19-95</td>
<td>9-20-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
</tbody>
</table>

**COMMENTS:** *Also utilized washover pipe (see Other Equipment or Re-inspection section above).*
## Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

### EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

**LOCATION:** Chestnut Ridge Waste Pile  
**DATE:** START: 6-22-95  
**DECONTAMINATION CREW:** Jim Gallaher/Jerry Gallaher  
**G. Shillings**  
**FINISH:** 9-20-95

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand T4W (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>6-21-95</td>
<td>6-22-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>6-21-95</td>
<td>6-22-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>See below</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>See below</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washover Pipe: 5-in. ID, 6 1/2-in. OD</td>
<td>6-21-95/</td>
<td>6-22-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Bit/stabilizer assembly: 9 7/8-in. diameter, length = 20.3 ft.</td>
<td>6-23-95</td>
<td>6-26-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Washover Pipe: 12-in. ID, 13 3/4-in. OD</td>
<td>6-28-95/</td>
<td>6-29-95/</td>
<td>Pass</td>
<td>TJC/SLA</td>
</tr>
<tr>
<td>Hole opener/stabilizer: 15-in. dia., length = 20.1 ft.</td>
<td>9-14-95</td>
<td>9-14-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Conductor casing used during reaming: 19 1/4-in. ID, 20-in. OD</td>
<td>9-14-95</td>
<td>9-14-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
</tbody>
</table>

**COMMENTS:**

- 96-001MS(A)/010996 E-10
# Equipment Decontamination Inspection Summary

**Location:** Chestnut Ridge Waste Pile  
**Date:** Start: 8-4-95  
**Decontamination Crew:** J. Gallaher/H. Hall, R. Phillips/J. Monger  
**Finish:** 8-25-95

<table>
<thead>
<tr>
<th>Equipment Description</th>
<th>Decon Date</th>
<th>Inspection Date</th>
<th>Inspection (Pass/Fail)</th>
<th>Inspector's Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drilling Rig: Ingersoll-Rand XL-T4W (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>8-2-95/8-3-95</td>
<td>8-4-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Drilling Tools (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>8-3-95</td>
<td>8-4-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Downhole Tools (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>See below</td>
<td>See below</td>
<td>See below</td>
<td>See below</td>
</tr>
<tr>
<td>Well Construction Materials (Casing, Screen, Centralizers, Etc.)</td>
<td>8-11-95*</td>
<td>8-11-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Workover Rig (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Development Tools (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other Equipment or Re-inspections (Specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washover Pipe: 4 1/2-in. ID, 6 1/2-in. OD</td>
<td>8-4-95/8-7-95/8-8-95</td>
<td>8-4-95/8-7-95/8-8-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Bit/stabilizer assembly: 9 7/8-in. diameter</td>
<td>8-8-95</td>
<td>8-8-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Washover Pipe: 11 7/8-in. ID, 13 3/4-in. OD</td>
<td>8-11-95/8-14-95 - 8-17-95</td>
<td>8-11-95/8-14-95 - 8-17-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Hole opener: 16-in. diameter</td>
<td>8-18-95</td>
<td>8-18-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>Conductor casing: 19 1/2-in. ID, 20 1/8-in. OD</td>
<td>8-21-95</td>
<td>8-21-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
</tbody>
</table>

**Comments:**  
*Used a section of 15 3/8-in. ID, 16-in. OD steel conductor casing to hold open the borehole collar while over washing the surface casing.*  
**Used a section of 19 1/2-in. ID, 20 1/8-in. OD conductor casing when hole opener bit would not fit inside the 15 3/8-in. ID casing.*
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

#### EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

**LOCATION:** Gum Branch Road Area  
**DATE:** START: 8-28-95

**DECONTAMINATION CREW:** H. Hall/J. Gallaher  
**FINISH:** 8-30-95

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG  Ingersoll-Rand XL-750 (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>8-28-95</td>
<td>8-28-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>8-28-95</td>
<td>8-28-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>8-29-95</td>
<td>8-29-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
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</tbody>
</table>

**COMMENTS:**

---

96-001MS(A)/011096  
**E-12**
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

LOCATION: Gum Branch Road Area
DATE: START: 8-28-95
DECONTAMINATION CREW: H. Hall
FINISH: 8-29-95

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand XL-750</td>
<td>8-25-95</td>
<td>8-28-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>(Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>8-25-95</td>
<td>8-28-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>8-25-95</td>
<td>8-28-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
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<td></td>
</tr>
<tr>
<td>WORKOVER RIG</td>
<td>-NA-</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>(Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
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<td></td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
<td></td>
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</tbody>
</table>

COMMENTS: 

96-001MS(A)/011096
# Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

## EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

<table>
<thead>
<tr>
<th>LOCATION: East Fork Poplar Creek</th>
<th>DATE: START: 4-29-96</th>
</tr>
</thead>
<tbody>
<tr>
<td>DECONTAMINATION CREW: G. Shillings/J. Gallaher</td>
<td>FINISH: 4-29-96</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG Altec Auger Truck (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>4-29-96</td>
<td>4-29-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>4-29-96</td>
<td>4-29-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>4-29-96</td>
<td>4-29-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Ballers, Pumps, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
<td>-</td>
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</table>

## COMMENTS:

96-001MS(F)/053196

E-14
# Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

## EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

<table>
<thead>
<tr>
<th>LOCATION:</th>
<th>East Fork Poplar Creek</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>START: 4-30-96</td>
</tr>
<tr>
<td></td>
<td>FINISH: 4-30-96</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG <em>Altec Auger Truck</em> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>4-29-96*</td>
<td>4-29-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>4-30-96</td>
<td>4-29-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>4-30-96</td>
<td>4-30-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

## COMMENTS: *S. Jones (HSEA) approves steam cleaning of augers and other drilling tools only.*
**EQUIPMENT DECONTAMINATION INSPECTION SUMMARY**

**LOCATION:** East Fork Poplar Creek  
**DATE:** START: 5-2-96

**DECONTOAMINATION CREW:** G. Shillings/J. Galisher  
**FINISH:** 5-7-96

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG, Ingersoll-Rand XL-750 (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>5-2-96</td>
<td>5-2-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevs, Chains, Etc.)</td>
<td>5-2-96</td>
<td>5-2-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>5-2-96</td>
<td>5-2-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Ballers, Pumps, Etc.)</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)**

- **Washover pipe: 6-in. OD, 5 1/4-in. ID**  
  - 5-2-96  
  - 5-2-96  
  - Pass  
  - TJC

- **Washover pipe: 9-in. OD, 8-in. ID**  
  - 5-2-96  
  - 5-3-96  
  - Pass  
  - TJC

- **Washover pipe: 13 1/4-in. OD, 12-in. ID**  
  - 5-6-96  
  - 5-6-96  
  - Pass  
  - TJC

- **Hole opener: 16-in. diameter**  
  - 5-6-96  
  - 5-6-96  
  - Pass  
  - TJC

**COMMENTS:**
# Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

## EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

**WELL NO.:** GW-671

**LOCATION:** East Fork Poplar Creek

**DATE: START:** 5-7-96

**DECONTAMINATION CREW:** G. Shillings

**DATE: FINISH:** 5-7-96

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG (Ford 555B Backhoe w/McMillan Digger, (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>NA*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belle, Clevis, Chains, Etc.)</td>
<td>5-7-96</td>
<td>5-7-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>5-7-96</td>
<td>5-7-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
<td>-</td>
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</table>

**COMMENTS:** Backhoe and auger motor decontaminated and "green-tagged" out of X-10 site on unknown date.
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

LOCATION: Gum Branch Road Area

DATE: START: 8-30-95

DECONTAMINATION CREW: R. Phillips

FINISH: 8-31-95

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR’S INITIALS</th>
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</thead>
<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand XL-750 (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>8-29-95</td>
<td>8-30-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>8-29-95</td>
<td>8-30-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>8-29-95</td>
<td>8-30-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
<td></td>
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<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
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</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
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<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
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COMMENTS:

96-001MS(A)/011096
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<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
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<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand XL-750</td>
<td>2-21-96</td>
<td>2-21-96</td>
<td>Pass</td>
<td>TJC</td>
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<tr>
<td>(Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
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<td></td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>2-21-96</td>
<td>2-21-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>2-21-96</td>
<td>2-21-96</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
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</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>NA</td>
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</tr>
<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>NA</td>
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<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
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<tr>
<td>Bit: 8 1/2-in. diameter</td>
<td>2-22-96</td>
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**LOCATION:** Gum Branch Road Area  
**DATE:** START: 2-21-96  
**FINISH:** 3-4-96  
**DECONTAMINATION CREW:** R. Phillips/H. Hall

**COMMENTS:**
### Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

#### EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

**LOCATION:** Gum Branch Road Area  
**DATE:** START: 8-31-95  
**DECONTAMINATION CREW:** H. Hall  
**FINISH:** 9-5-95

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<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand XL-750 (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>8-30-95</td>
<td>8-31-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>8-30-95</td>
<td>8-31-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>8-30-95</td>
<td>8-31-95</td>
<td>Pass</td>
<td>TJC</td>
</tr>
<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
<td>-NA-</td>
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<td></td>
</tr>
<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
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<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
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<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
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**COMMENTS:**

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96-001MS(A)/09195  
E-20
## Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

### EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

**LOCATION:** Gum Branch Road Area  
**DATE:** START: 2-15-95  
**FINISH:** 3-1-95  
**DECONTAMINATION CREW:** R. Phillips/H. Hall

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<thead>
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<th>EQUIPMENT</th>
<th>DECON DATE</th>
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<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
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<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand XL-750 (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>2-14-95</td>
<td>2-15-95</td>
<td>Pass</td>
<td>TJC</td>
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<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>2-14-95</td>
<td>2-15-95</td>
<td>Pass</td>
<td>TJC</td>
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<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>2-14-95</td>
<td>2-15-95</td>
<td>Pass</td>
<td>TJC</td>
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<tr>
<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
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<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
<td>-NA-</td>
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<tr>
<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
<td>-NA-</td>
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<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
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<tr>
<td>Washover Pipe: 8 1/4-in. ID, 9 1/2-in. OD</td>
<td>2-16-95</td>
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<td>Pass</td>
<td>TJC</td>
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### COMMENTS:
# Equipment Decontamination Inspection Summary

**Location:** Gum Branch Road Area  
**Date:** Start: 10-2-95  
**Decontamination Crew:** J. Monger  
**Finish:** 10-4-95

<table>
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<tr>
<th>Equipment Description</th>
<th>Decon Date</th>
<th>Inspection Date</th>
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<th>Inspector's Initials</th>
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<tbody>
<tr>
<td>DRILL RIG <em>Ingersoll-Rand XL-750</em> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>10-3-95</td>
<td>10-3-95</td>
<td>Pass</td>
<td>TJC</td>
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<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>10-3-95</td>
<td>10-3-95</td>
<td>Pass</td>
<td>TJC</td>
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<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
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<td>-NA-</td>
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<tr>
<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
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<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
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<tr>
<td>OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)</td>
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**Comments:**

---

**WELL NO.**: P&A 1

**INSTALLATION**: P&A [X]
Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

LOCATION: Gum Branch Road Area               DATE: START: 10-4-95
DECONTAMINATION CREW: E. Lyons                FINISH: 10-9-95

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DECON DATE</th>
<th>INSPECTION DATE</th>
<th>INSPECTION (PASS/FAIL)</th>
<th>INSPECTOR'S INITIALS</th>
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<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand XL-750</td>
<td>10-4-95</td>
<td>10-4-95</td>
<td>Pass</td>
<td>TJC</td>
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<td>(Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
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<tr>
<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
<td>10-4-95</td>
<td>10-4-95</td>
<td>Pass</td>
<td>TJC</td>
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<tr>
<td>DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)</td>
<td>10-4-95</td>
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<td>WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)</td>
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<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
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<td>DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)</td>
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COMMENTS:

96-001MS(C)/122095
# Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

## EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

**LOCATION:** Gum Branch Road Area/Haul Road  
**DATE:** START: 10-6-95  
**DECONTAMINATION CREW:** E. Lyons/H. Hall  
**FINISH:** 10-11-95

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<tbody>
<tr>
<td>DRILL RIG Ingersoll-Rand XL-750 (Mast, Chassis, Cables, Carousel, Hoses, Etc.)</td>
<td>10-4-95</td>
<td>10-6-95</td>
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<td>TJC</td>
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<td>DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)</td>
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<td>WORKOVER RIG (Mast, Chassis, Cables, Hoses, Etc.)</td>
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**COMMENTS:**

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96-001MS(C)/011096  
E-24
APPENDIX F

WELL LOCATION MAPS
NOTICE
